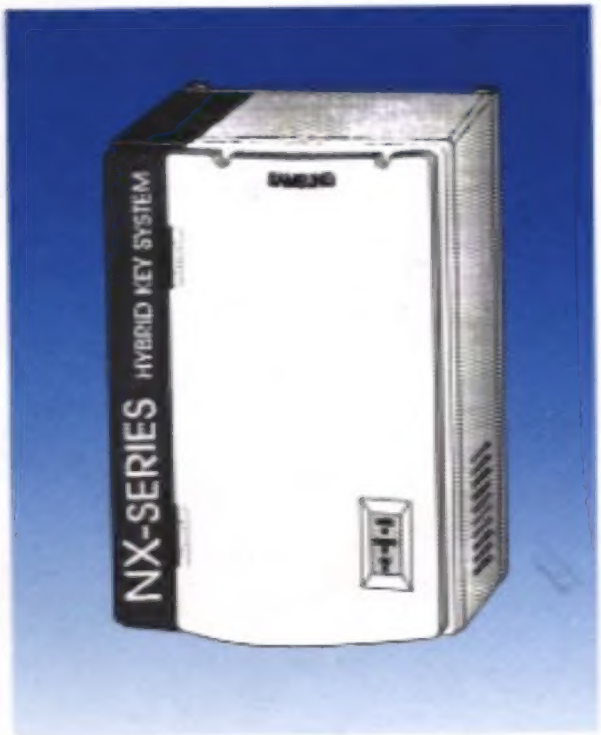
SAMSUNG

# NX-SERIES

*(NX-308, NX-820, NX-1232)*

# SERVICE Manual

## DISPLAY NX-SERIES

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# 1.GENERAL DESCRIPTION

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# 1.GENERAL DESCRIPTION

## 1.1 SYSTEM OVERVIEW

The **NX-series** hybrid key system has three kinds of Key Service Unit - **NX-308**, **NX-820** and **NX-1232**.

### 1.1.1 NX-308 SYSTEM

The **NX-308** system is an analog telephone system designed for small-sized business. The **NX-308** system has a maximum capacity of **three(3) telephone lines** and **eight(8) station s**. A powerful **HM64180R1** microprocessor digitally controls all speech paths and system functions. The operating program with default memory is stored in non-volatile ROM **27C020**. Customer data is stored in RAM **62256** and protected by Ni-Cd battery for up to seven day's continuous loss of system power. When AC power is restored, the Ni-Cd battery is recharged.

### 1.1.2 NX-820 SYSTEM

The **NX-820** system is an analog telephone system designed for small to medium-sized business. The **NX-820** system has a maximum capacity of **twenty eight(28) ports**, the sum of telephone lines and stations, of which combination is flexibly selected. Comprised of only a Key Service Unit, expansion boards, electronic keysets and conventional single line telephones, **NX-820** system offers small or medium-sized business user's flexibility and control of telephone communications. A powerful **HM64180R1** microprocessor digitally controls all speech paths and system functions. The operating program with default memory is stored in non-volatile ROM **27C020**. Customer data is stored in **RAM 681000** and protected by Ni-Cd battery for up to seven day's continuous loss of system power. When AC power is restored, the Ni-Cd battery is recharged.

### 1.1.3 NX-1232 SYSTEM

The **NX-1232** system is an analog telephone system designed for small to medium-sized business. The **NX-1232** system has a maximum capacity of **forty eight(48) ports**, the sum of telephone lines and stations, of which combination is flexibly selected. Comprised of only a Key Service Unit, expansion boards, electronic keysets and conventional single line telephones, **NX-1232** system offers small or medium-sized business user's flexibility and control of telephone communications. A powerful **HM64180R1** microprocessor digitally controls all speech paths and system functions. The operating program with default memory is stored in non-volatile ROM **27C020**. Customer data is stored in **RAM 681000** and protected by Ni-Cd battery for up to seven day's continuous loss of system power. When AC power is restored, the Ni-Cd battery is recharged.

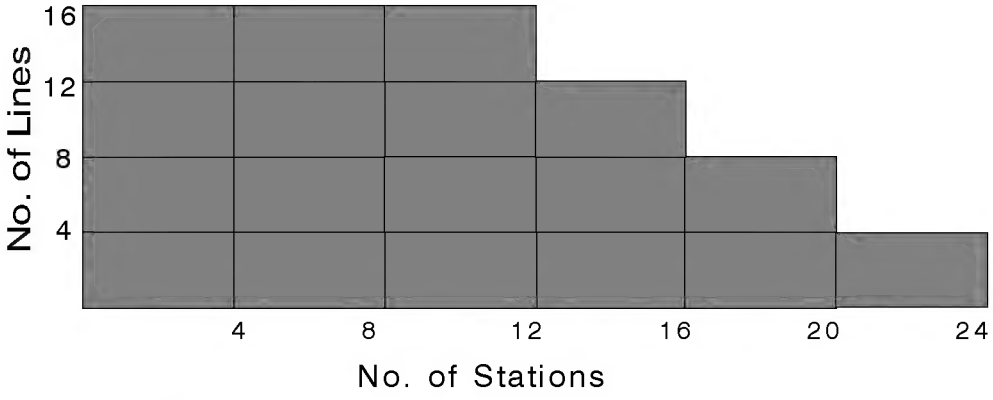
# 1.2 SYSTEM CONFIGURATION

## 1.2.1 NX-308 SYSTEM

The basic KSU (Key Service Unit) comes equipped to operate **three(3) telephone lines** and **eight (8) stations**. Station from #1 is assigned to be used with a keyset and stations from #2 to #8 are assigned for keysets or single line telephones which can be respectively selected. Optionally, the **NX-SMDR/R-MMC** and **NX-DPH/PAGING** can be installed.
The **NX-SMDR/R-MMC** card is the serial interface card for SMDR and REMOTE MMC and the **NX-DPH/PAGING** card is the doorphone and external paging interface card. These cards can be installed on the base board.

## 1.2.2 NX-820 SYSTEM

TThe basic KSU (Key Service Unit) comes equipped to operate **four (4) telephone lines** and **twelve (12) stations**. Station from #1 to #4 are assigned to be used with keysets and stations from #5 to #12 are assigned for single line telephones. The NX-820 system has several kinds of expansion cards. The **NX-2TRUNK**, the **NX-4TRUNK**, the **NX-4KLI**, the **NX-4SLI** and the **NX-4 OPX** card can be installed in any slot of the three expansion slots. By combining these cards, the **NX-820** system can be increased to its maximum capacity of **twenty eight (28) ports**.




Basic KSU

Basic KSU, one 4 SLT (or 4 KTS) Board and one 4 TRK Board

Basic KSU, one 4 SLT (or 4 KTS) Board and two 4 TRK Board

Basic KSU and three 4 TRK Board

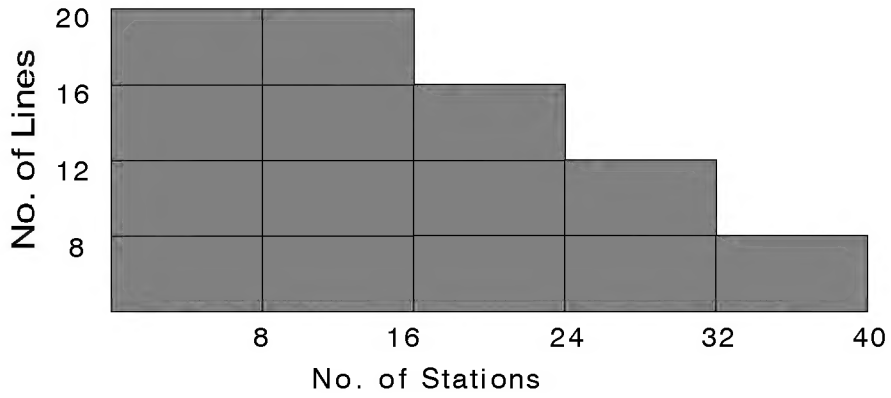
Basic KSU, two 4 SLT (or 4 KTS) Board and one 4 TRK Board

Basic KSU and three 4 SLT (or 4 KTS) Board

Optionally, the **NX-SMDR/R-MMC** and **NX-DPH/PAGING** card can be installed.
The **NX-SMDR/R-MMC** card is the serial interface card for SMDR and REMOTE MMC and the **NX-DPH/PAGING** card is the doorphone and external paging interface card. These cards can be installed on the base board.
The above chart describes configurations using expansion cards.

## 1.2.3 NX-1232 SYSTEM

The basic KSU (Key Service Unit) comes equipped to operate **eight (8) telephone lines** and **sixteen (16) stations**. Station from #1 to #8 are assigned to be used with single line telephones or keysets which is respectively selected, and stations from #9 to #16 are assigned for single line telephones. The **NX-1232** system has several kinds of expansion cards. The **NX-2TRUNK**, the **NX-4TRUNK**, the **NX-4KLI**, the **NX-4SLI**, the **NX-4OPX**, the **NX-8KLI**, and the **NX-8 SLI** card can be installed in any slot of the three expansion slots. By combining these cards, the **NX1232** system can be increased to its maximum capacity of **forty eight (48) ports**.
Optionally, the **NX-SMDR/R-MMC** and **NX-DPH/PAGING** card can be installed.
The **NX-SMDR/R-MMC** card is the serial interface card for SMDR and REMOTE MMC and the **NX-DPH/PAGING** card is the doorphone and external paging interface card. These cards can be installed on the base board.The below chart describes configurations using expansion cards.




Basic KSU

Basic KSU, one 8 SLT (or 8 KTS) Board and one 4 TRK Board

Basic KSU, one 8 SLT (or 8 KTS) Board and two 4 TRK Board

Basic KSU and three 4 TRK Board

Basic KSU, two 8 SLT (or 8 KTS) Board and one 4 TRK Board

Basic KSU and three 8 SLT (or 8 KTS) Board

# 1.3 SPECIFICATIONS

## 1.3.1 ELECTRICAL SPECIFICATIONS

| | | |
|---|---|---|
| AC INPUT | 110/220 $V_{AC}$, 50/60 Hz | |
| POWER CONSUMPTION | NX-308 | 50 WATTS MAX |
| | NX-820 | 55 WATTS MAX |
| | NX-1232 | 80 WATTS MAX |
| MAX CURRENT DRAW AT 220 $V_{AC}$ | NX-308 | 0.22 AMP |
| | NX-820 | 0.29 AMP |
| | NX-1232 | 0.36 AMP |
| RING GENERATOR | AC 80 Vrms, 25 Hz | |
| BATTERY BACKUP SUPPLY | 24 $V_{DC}$ Batteries rating not less than 6 hours but not more than 26 hours | |

## 1.3.2 DIMENSIONS AND WEIGHTS

| | | |
|---|---|---|
| KEY SERVICE UNIT | NX-308 | 530 mm(H) × 348 mm(W) × 102 mm(D), 4.9 Kg |
| | NX-820 | 530 mm(H) × 412 mm(W) × 140 mm(D), 8.9 Kg |
| | NX-1232 | 530 mm(H) × 412 mm(W) × 140 mm(D), 8.9 Kg |
| KEYSET | | 214 mm(H) × 206 mm(W) × 150 mm(D), 1.1 Kg |
| AOM | | 214 mm(H) × 133 mm(W) × 150 mm(D), 0.4 Kg |
| DOOR PHONE | | 158 mm(H) × 89 mm(W) × 41 mm(D), 0.23 Kg |

## 1.3.3 ENVIRONMENTAL LIMITATIONS

| | |
|---|---|
| OPERATING TEMPERATURES | 0 ℃ - 45 ℃ (18 ℃ - 25 ℃ recommended) |
| OPERATING HUMIDITY | 10 % - 90 % (without condensation) |

## 1.3.4 CABLE REQUIREMENTS

| | |
|---|---|
| ELECTRONIC SET | 2 pair twisted, Max. 400 m (24 AWG) |
| SINGLE LINE TELEPHONE | 1 pair twisted, Max. 1 km (24 AWG) |
| DOOR PHONE | 1 pair twisted, Max. 100 m (24 AWG) |

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# 2. CIRCUIT DESCRIPTION

## 2.1 TRUNK INTERFACE CIRCUIT

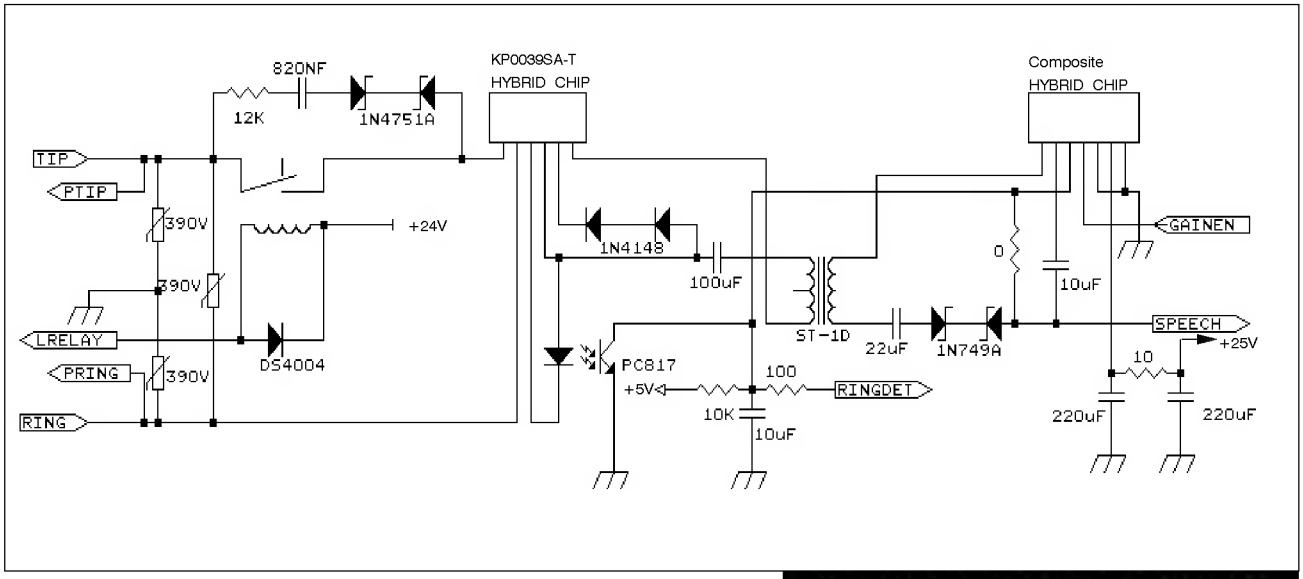
Loop trunks have two outside line connections that are called as Ring and Tip terminals. Ring terminal receives the ring signal and it is a reference line for signaling and speech. And the Tip terminal receives the hot signals. Generally, the terminals of Loop start trunk have no polarity.
Anyway, loop control is the main signaling at loop-start trunk. In idle state, the loop is disconnected and the loop becomes accomplished for starting of signaling.

After the loop is made, Dial Pulses or DTMF signals are transmitted for addressing.
The exchange equipment accommodating the line may detect the address signals and operate to connect the originate to the opposite according to the addressing signals.
It describes the outgoing procedure of the loop start trunk.

Its incoming procedure is as follows;
The Ring signal is generated by exchange and can be detected at this interface. The system detects the ring signal and gives that to the assigned station.

The features of the Trunk Interface Circuit are as follows;

- Surge Protection
- Ring Signal/DC Loop Detection
- DC Loop/DC BYPASS
- AC Impedance Matching
- Metering Pulse / PRS Detection




**TRUNK CIRCUIT DIAGRAM**

## 2.1.1 Surge Protection

This feature is applied to common mode and normal mode. Both of these two modes are protected from over-voltage over 390 V.
To protect the system from surge or over-voltage, three 390 V varistors are used.
To protect from longitudinal high voltage, two varistors are used between Tip and earth and between Ring and earth. These two varistors clip high voltage.
Protecting from metallic surge, one 390 V varistor is used between Tip and Ring.
Frequently lightening site has to include additional surge suppresser to the line in parallel, and must have system ground.

## 2.1.2 Ring Signal/DC Loop Detection

When the Ring Signal incomes from the trunk line, the Ring Signal transmitted through the path of 3K R - MM824 C - 1N4751A - KP0039SA - PC817. This R, C, and Zener diodes decide the ring impedance.
When the Ring Signal incomes, pin 4 of PC817 goes High to Low. The CPU detects the Low status and knows the Ring is in the trunk line.
Additionally, when the DC loop is completed by trunk Loop Relay, pin 4 of PC817 go High to Low, too. The CPU activates the Loop Relay to check in 4 of PC 817 and can detect the connection status of trunk line.
So, the role of PC817 opto coupler is detecting incoming ring and DC Loop.

## 2.1.3 DC Loop/DC BYPASS

In idle status, the Loop Relay moves to Tip line to make up DC Loop. DC Loop means the DC resistance.
DC current can flow through the DC Loop when DC voltage is given to the circuit.
DC Loop completion means that -48V power is connected to the DC resistance by using the relay. This DC resistance may have very large AC impedance.
This feature is called DC BYPASS and accomplished by the Hybrid Chip (KP0039SA-T).
DC resistance provided by KP0039SA-T is determined by the current from trunk line, and generally in the range of 50 ohm to 400 ohm.

## 2.1.4 AC Impedance Matching

AC impedance is determined by the characteristics of the transformer. The transformer, ST-1D, is an audio transformer that isolates the system from the trunk interface and its turn ratio is designed to 1 : 1.5 (600 ohm : 1350 ohm), which reduces the loss on the network.
The audio signal may be transferred from or to network through the clipping circuit that is composed of two Zener diodes of which Zener voltage is respectively 4.3V.
The Zener diode (1N0047SA) protects the network from any over-voltage, of which signal range is recommended from -5V to plus 5V.
Composite Hybrid Chip is the compensate circuit to reduce the insertion loss of the trunk and station (up to 1dBm).
If this Hybrid Chip is not used, o ohm resistance is used.

## 2.1.5 Metering Pulse (MP)/Polarity Reverse Signal (PRS) Detection

This feature is used to determine the cost of the call and provided by optional D-B'd equipped with the trunk circuit.

### 2.1.5.1 Metering Pulse Detection Circuit

Metering Pulse is the periodic high frequency pulses (12 kHz or 16 kHz) are returned from the central office to the system to determine the cost of the call.
To detect these pulses, the Low Pass Filter inside the Hybrid Chip is used. The Low Pass Filter detects 12 kHz or 16 kHz pulses; the CPU gets these pulses and counts the number of pulses and determines the cost of the call.

### 2.1.5.2 Polarity Reverse Signal Detection Circuit

PRS is the signal from the central office that turns the polarity of Tip and Ring in the reverse direction.
To detect this signal, opto coupler is used. The opto coupler detects the direction of the current; The CPU detects that and determines the cost of the call.

# 2.2 SINGLE LINE TELEPHONE INTERFACE CIRCUIT

Most of the current single line telephones operate with loop-start protocol and they may be equipped with the dialers to generate dial pulses or DTMF signals.
This interface is designed to serve two kinds of addressing signals; dial pulses and DTMF signals.

The features of the SLT interface circuit are as follows;

- DC Power Feeding Part
- Ring Signal Feeding Part
- Loop/Pulse Detection Circuit
- Speech Transmission Circuit
- Over-voltage Protection Part

## 2.2.1 DC Power Feeding Part

The Hybrid Chip (SLC-03) includes power feeding part with speech signal transmission and loop /pulse detection circuit.
The regulated DC from the connection B'd is fed through the hybrid device. The DC value is about 25 volts, and varying according to the power input voltage and load.
While SLT is in On-Hook status, the circuit is open. That means there is no path to flow the current. In other case, while Off-Hook status, Tip and Ring make DC loop that measured as about 50 ohm ~ 300 ohm DC resistance.
After DC Loop is completely made up, voltage level between Tip and Ring is dropped.
Transistor A709 and C1209 turn on under cut-off status, too.

## 2.2.2 Ring Signal Feeding Part

The Ring Signal generated on the Power B'd may be fed through the ring relay in the ring control part. The CPU adjusts the cadence of ring signals.

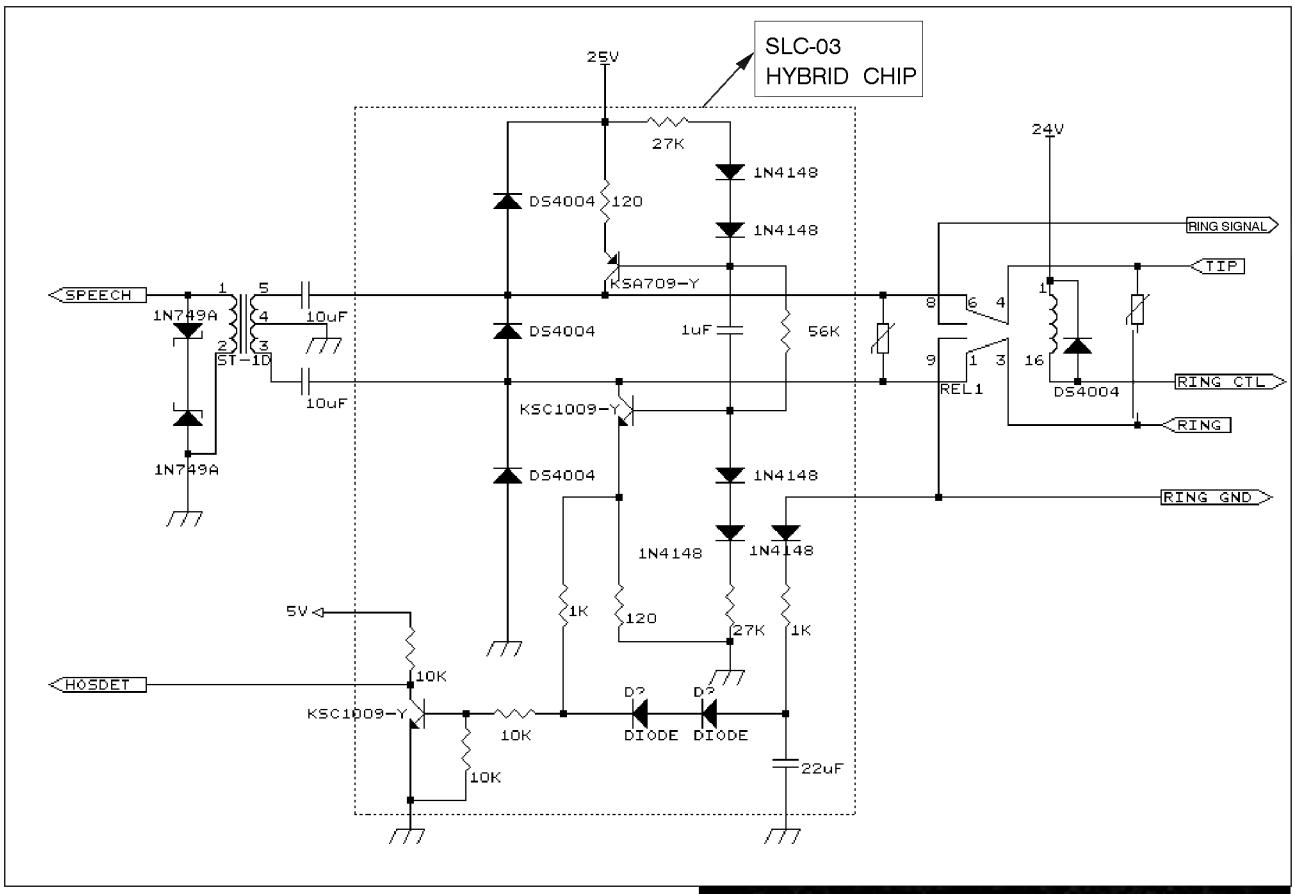
The ring signal path includes the serial resistors for short protection.

## 2.2.3 Loop/Pulse Detection Circuit

The Loop/Pulse Detection Circuit in the Hybrid device will perceive the loop condition.
For detecting the loop during ringing, ring trip circuit is simply attached.
The result to detect loop/pulse is respectively connected to the read buffer (74HC244) and the CPU gets the data.

## 2.2.4 Speech Transmission Circuit

Transformer ST-1D is prepared for power isolation of the speech path that is the same with the transformer in trunk interface circuit for impedance matching and reduction of the network loss. Two zener diodes (1N749A) are attached to protect the network chips from any over-voltage.




SLT INTERFACE CIRCUIT DIAGRAM

## 2.2.5 Over-voltage Protection Part

Either the communication path is made up or not, over-voltage on the Tip and Ring may damage the system. The over-voltage is made by the line or lighting strikes and either direct or indirect. To protect the damage, the 270 V and 33V varistors are connected between Tip and Ring in parallel.

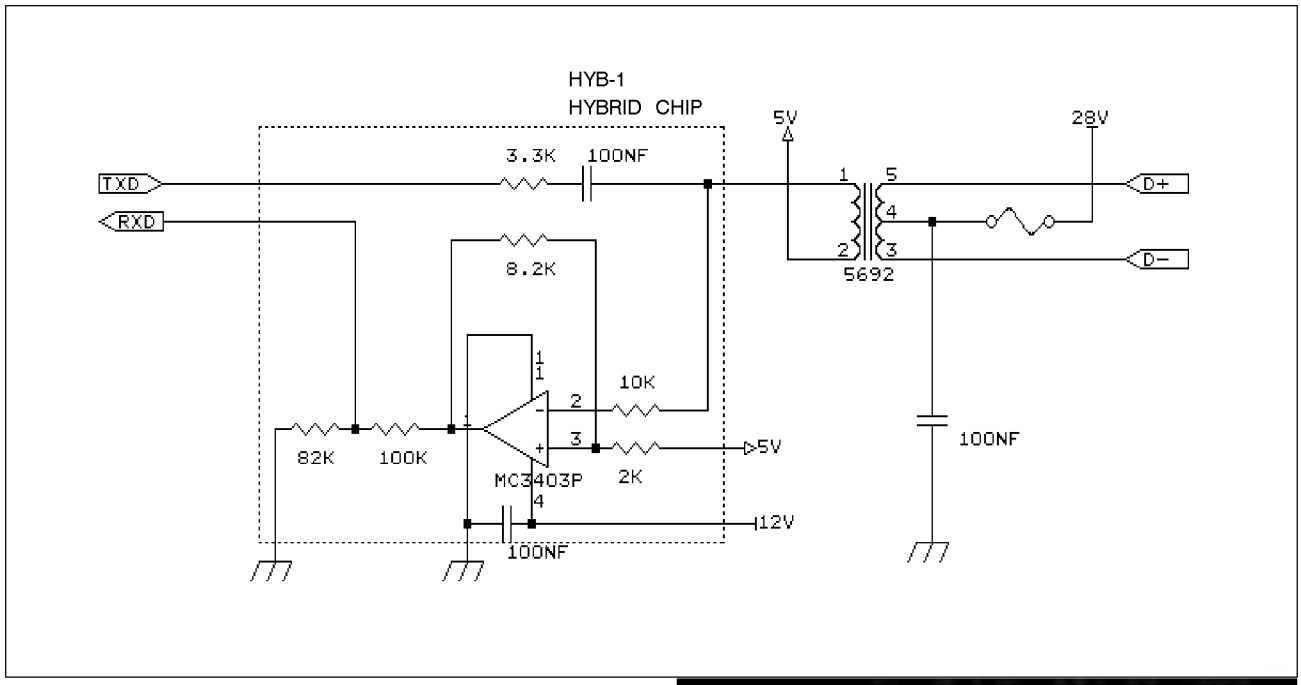
# 2.3 KEYSET INTERFACE CIRCUIT

The keyset is the proprietary equipment of the system and it may not operate with the other systems.
Keyset interface is for connecting the keyset to the system.

The interface consists of two paths; ***data path*** and ***speech path***.
The data path enables the data communications between the system and the keyset and the speech path is for the speech signal transmission.

Since each path is accomplished with two wires, to install one keyset requires four wires.
With regard to a keyset, the data communications are asynchronous and serial. Each bit duration is 3 msec.

The sending data (TxD) to keyset are as follows;




**KTS INTERFACE CIRCUIT DIAGRAM**

| | | |
|---|---|---|
| 1 | start bit | High state |
| 3 | Network ID | MSB first, keyset network control data |
| 8 | First Data byte | MSB first |
| | Second Data byte | MSB first |
| 2 | Waiting bits | Low state |

The data to keyset are inverted at the demodulation circuit in keyset and the sending data consists of 22 bits including waiting bits as above.
After sending the data, the system receives the data (RxD) from keyset.

The receiving data (RxD) from keyset are as follows;

| | | |
|---|---|---|
| 1 | start bit | Low state |

| | | |
|---|---|---|
| 1 | Parity bit | Even Parity Check |
| 7 | Data bits | MSB first |
| 2 | Waiting bits | High state |

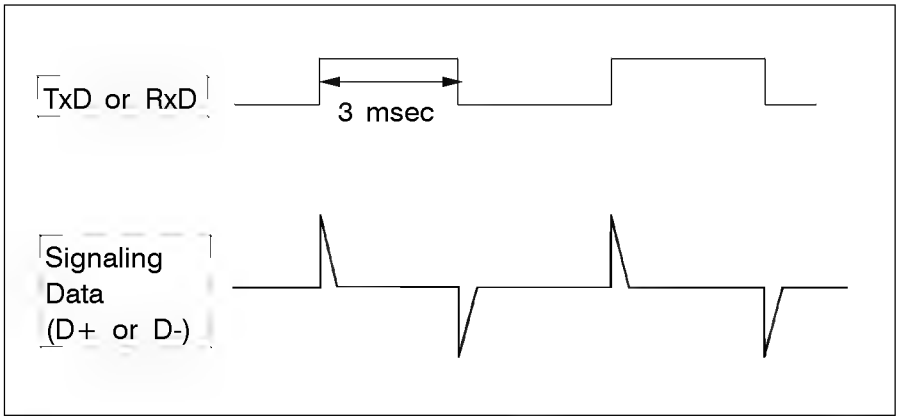
The system receives 11 bits from keyset and parity bit is for checking any fault in data communications.
As above, one data monitor is accomplished.
Immediately after receiving the data from keyset, the system sends its data again.
Sending and Receiving data are totally composed of 33 bits and it requires 99 msec.

The keyset data-communication consists of;

- Modulation circuit
- Demodulation circuit
- Power isolators

The **modulation/demodulation circuits** come to the hybrid device (HYB) or discrete parts. The modulation is accomplished with differentiating the pulse data. The transition from low to high is converted to high peak and the transition from high to low is converted to low peak of which time constant is determined by resistor and the capacitor.

The modulated signal is transmitted through the transformer, 5692 that is applied for power isolation.




The data from keyset is also the differentiated form and received through the same transformer. The modulated signal is converted to the pulse with the demodulation circuit. The signal level is detected and high/low thresholds determine the output to High/Low data. The noise margin is 0.8 volts that is determined by high/low threshold levels.

The speech path is simply composed of the isolation transformer (ST-1D) and the network protection devices.

Two zener diodes (1N749A) block and cut down any over-voltage that is over 4.3 volt to protect the network devices.

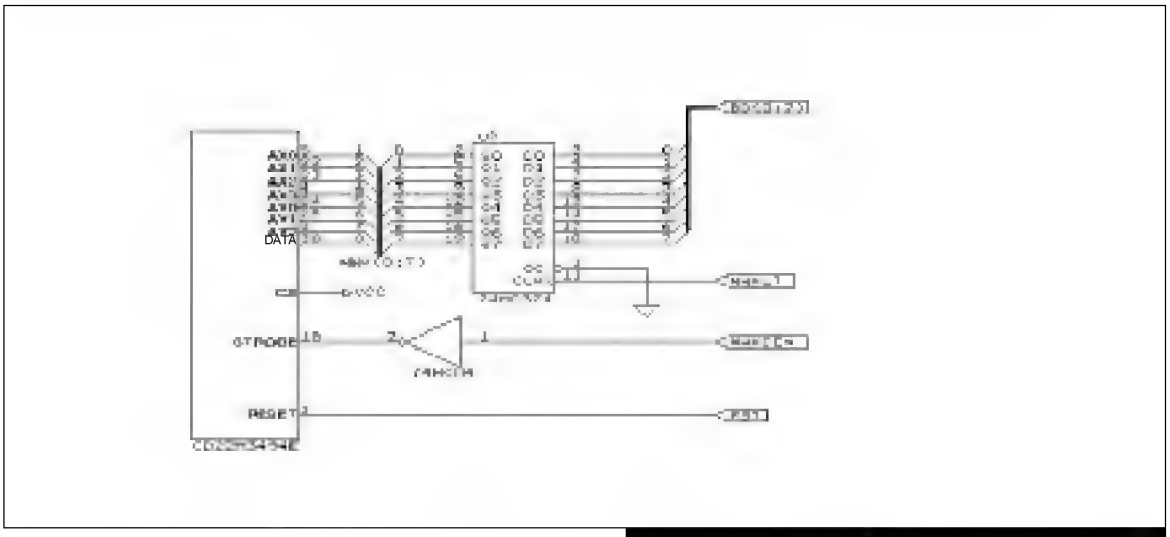
The keyset power is supplied by the system via the data and speech path wires. The system ground is fed through the center-tapped terminal of the speech transformer and the high power about 30 volts is fed through the center-tapped terminal of the data transformer.

On the high power feeding line, a thermistor (poly switch) is prepared for short-protection.

# 2.4 NETWORK CIRCUIT

The system is equipped with network for switching all kinds of calls. The network is composed of cross-point chip (M3494).

The system used Space Division Exchange that is usually called as an analog system.

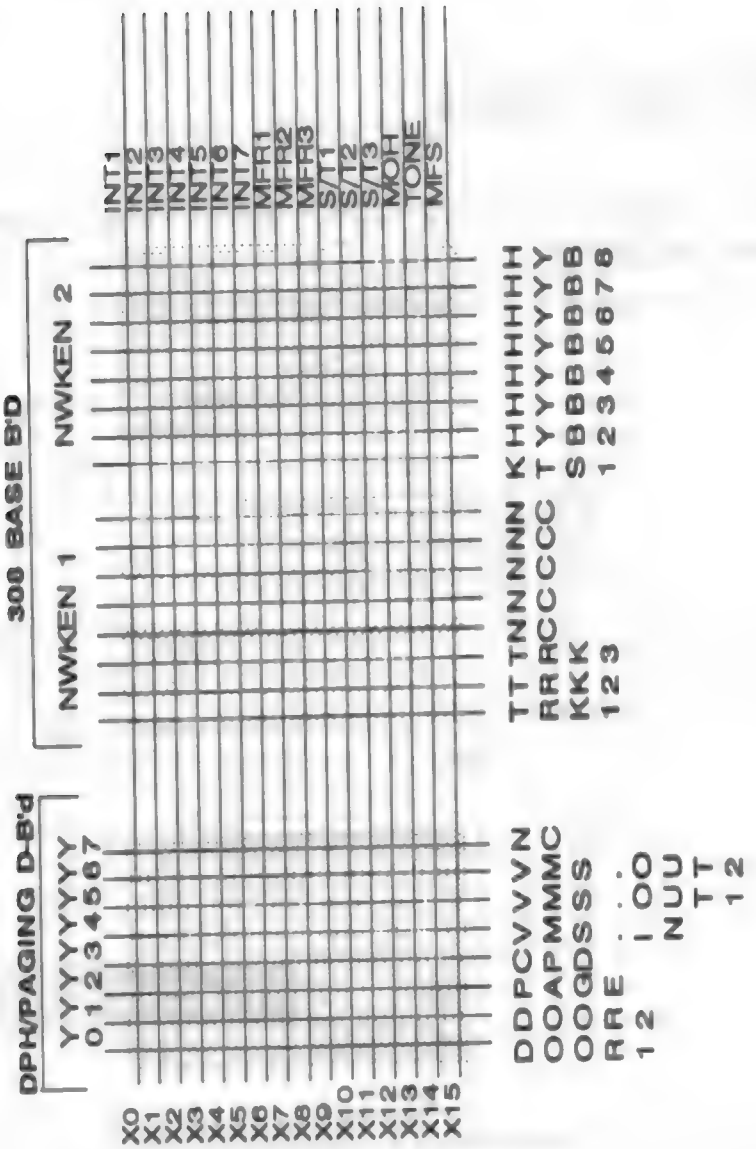



**NETWORK CIRCUIT DIAGRAM**

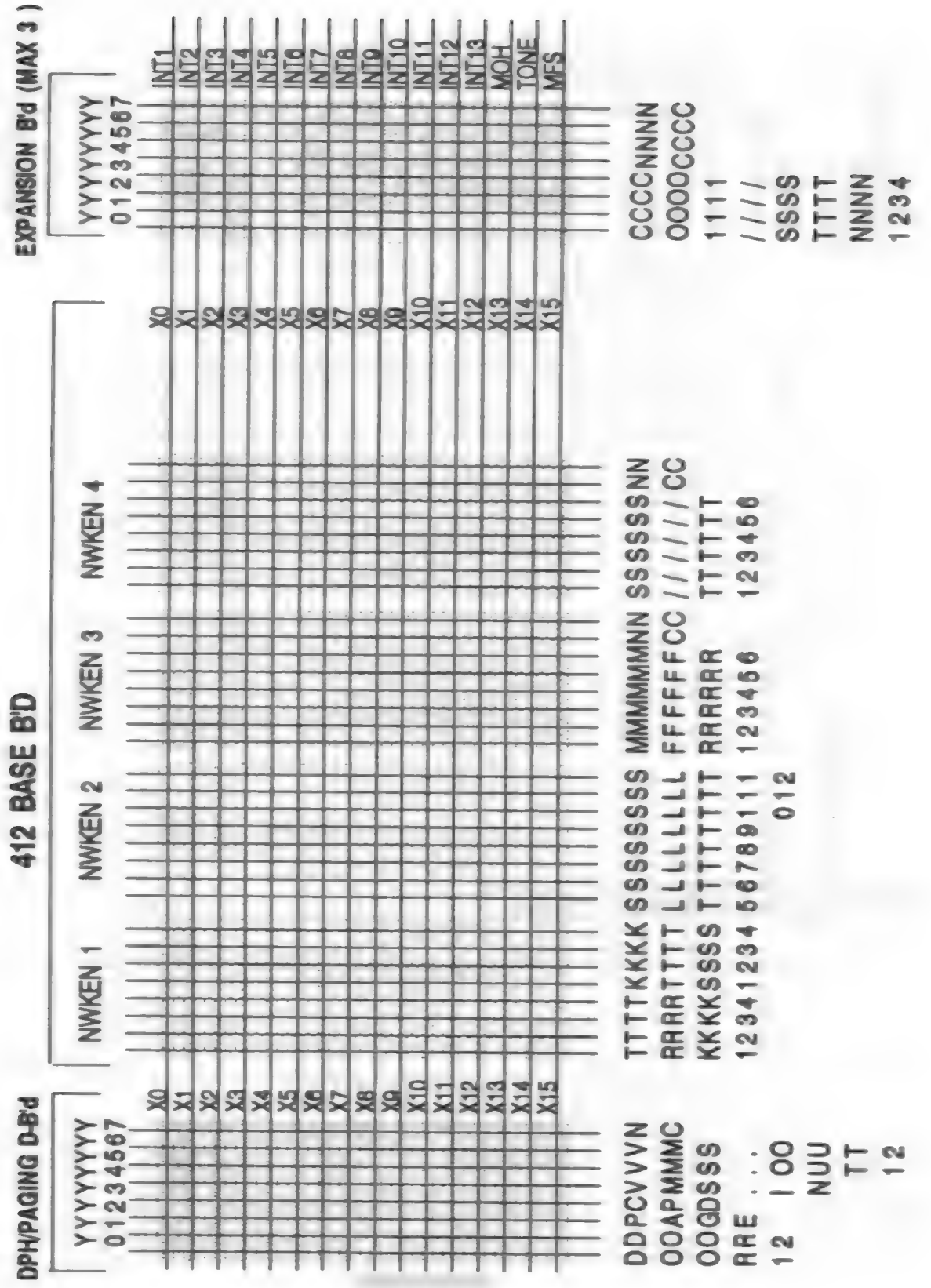
The M3494 contains a 16 by 8 array of cross-point. e by selecting the appropriate 7 input bits (AX0~AX3, AY0~AY2).
The selected switch can be turned ON or OFF by applying a logical one or zero to the data in and the strobe input is set to logical one. A reset signal can be used to turn off all the switches together when it is set to logical one.

Each system has different cross-point configuration. From next page, Each system's cross-point is described.

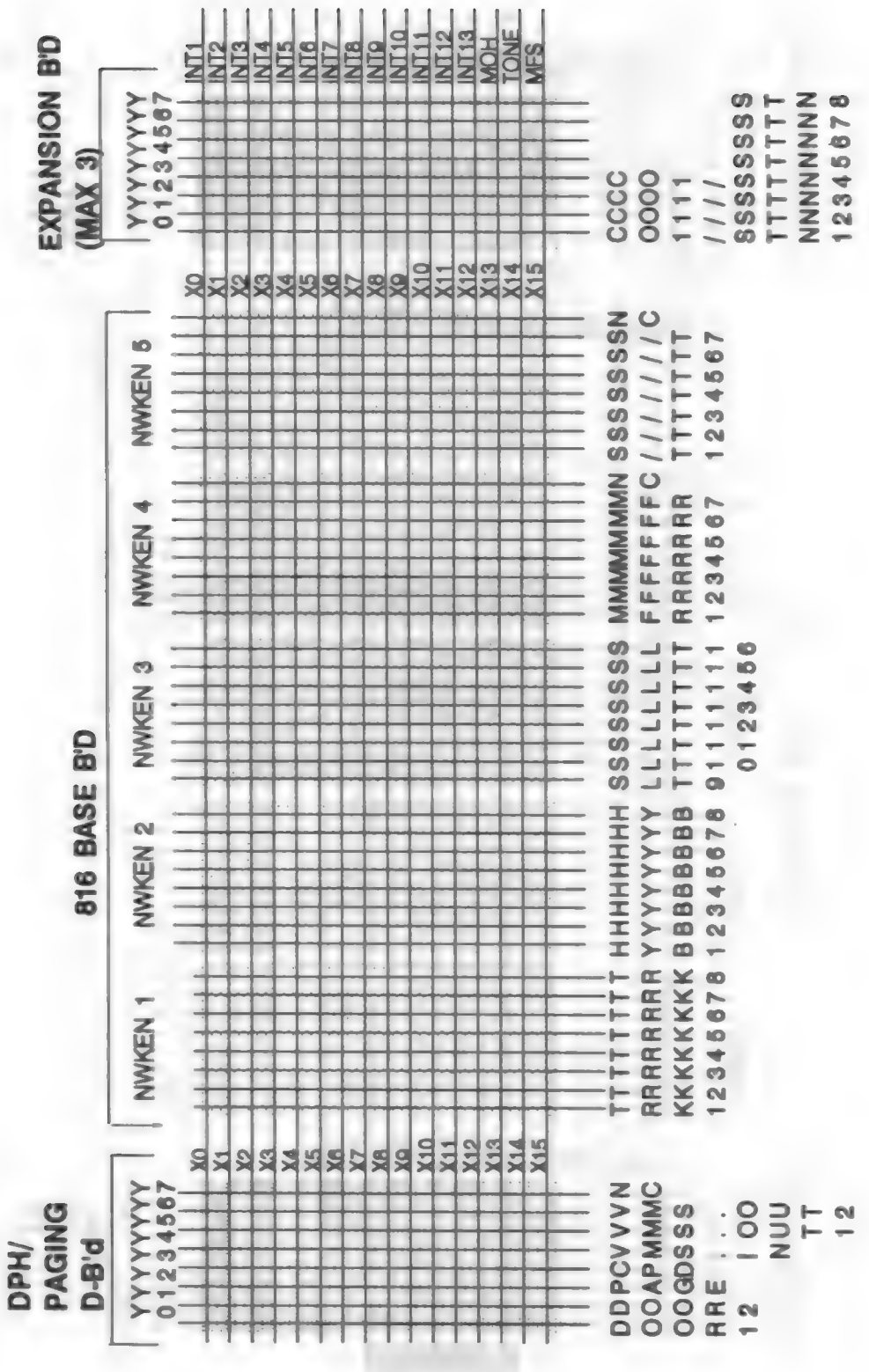
## 2.4.1 NX-308 SYSTEM



## 2.4.2 NX-820 SYSTEM



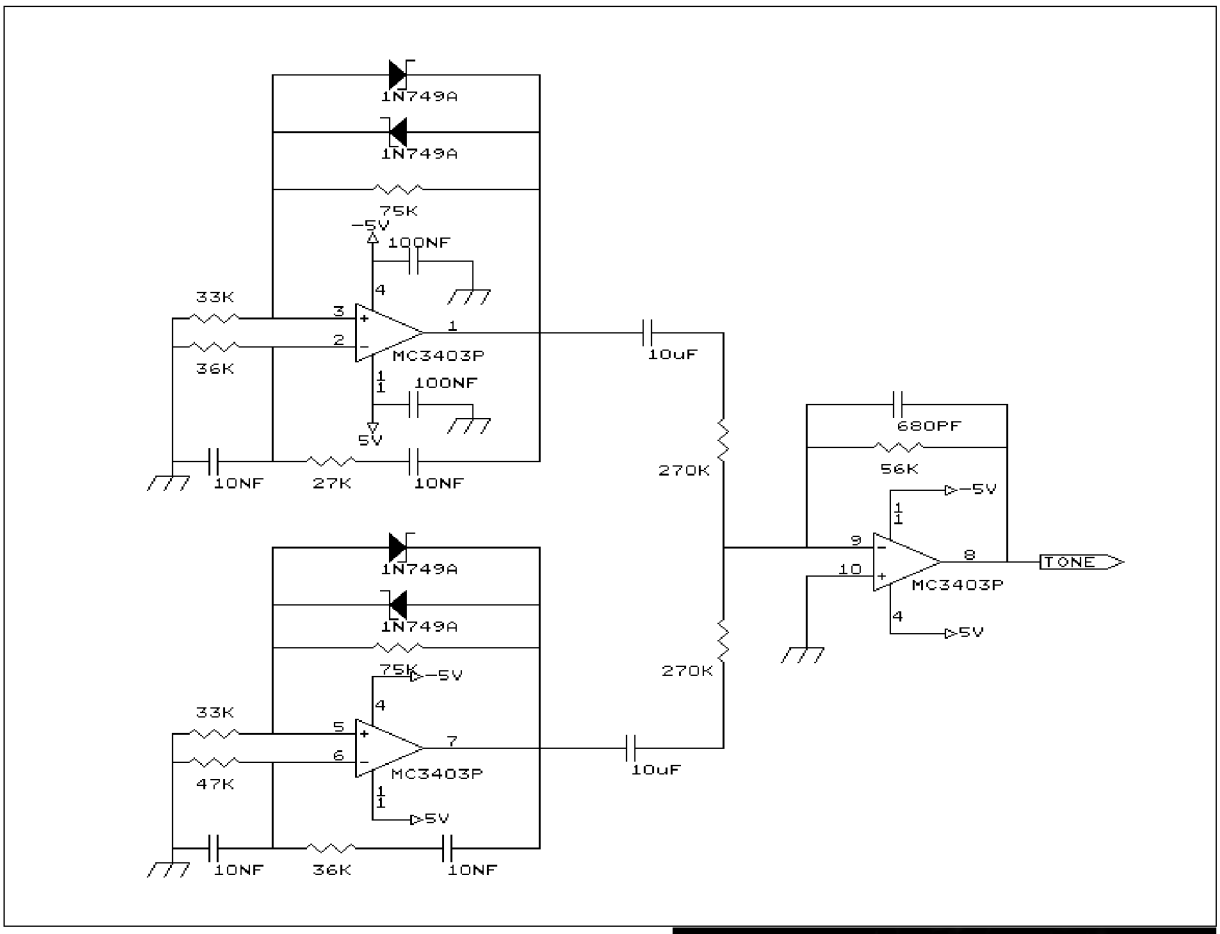
## 2.4.3 NX-1232 SYSTEM



# 2.5 TONE GENERATOR CIRCUIT

Tone Generator provides user the dual frequency signal for indicating call progressing. That is usually called as Audible Indications.

There are so many kinds of tones provided by an exchange system; *Dial Tone, Busy Tone, Ringback Tone, and Reorder Tone, etc.*
System provides one dual frequency signal for them, of which cadences; ON/OFF periods; are adjusted differently for indications.



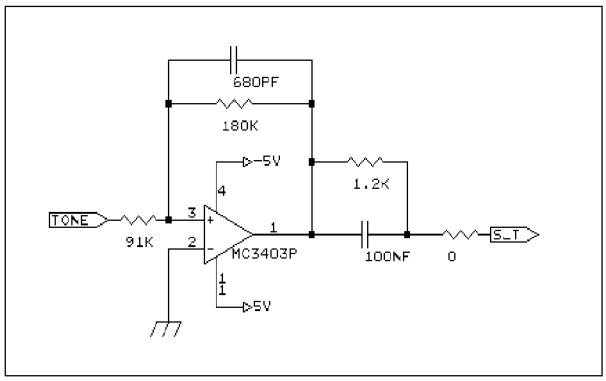

**TONE GENERATOR CIRCUIT**

The generator consists of **Wien Bridge Oscillator** that is commonly used owing to its reliability and simplicity.

Any signal amplifier can be used for Wien Bridge oscillator. Two OP-AMPs are used for generating the dual frequency signals and one OP-AMP is used for mixing the signals and adjusting the level.
The upper OP-AMP in the figure generates the low frequency signal (350 Hz), and the lower does the high frequency signal (440 Hz). The middle OP-AMP mixes the generated dual signals and makes tone.

The generated tone signal is fed to directly to network for call progressive tone signals. The

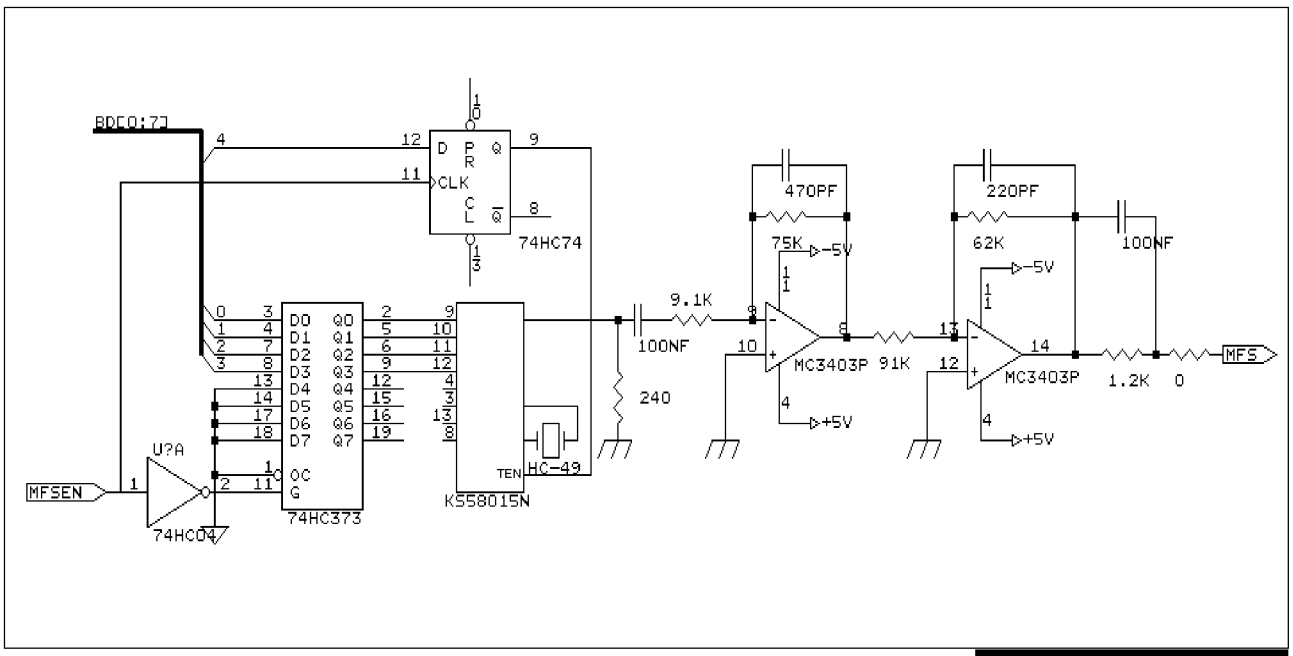
output impedance of OP-AMP is all-most GND and the tone source can be driven some ports at the same time.




**Dial Tone Source for Single line Telephone** should have the terminating impedance. Otherwise, the co-operated DTMF receiver can not detect dialing owing to the sink of the DTMF signals from SLT.
For the terminating impedance, the small signal amplifiers are interfaced and Network is required.
The system uses 1.2K Ohm resistor for termination and it results in signal amplification, because the level of tone signal decrease without amplification.

# 2.6 DTMF SENDER (MFS) CIRCUIT

The system is equipped with one DTMF sender that sends DTMF signals to the outside lines. Generally, DTMF sender provides 16 DTMF signals but only 12 DTMF signals are used commercially.




**MFS CIRCUIT**

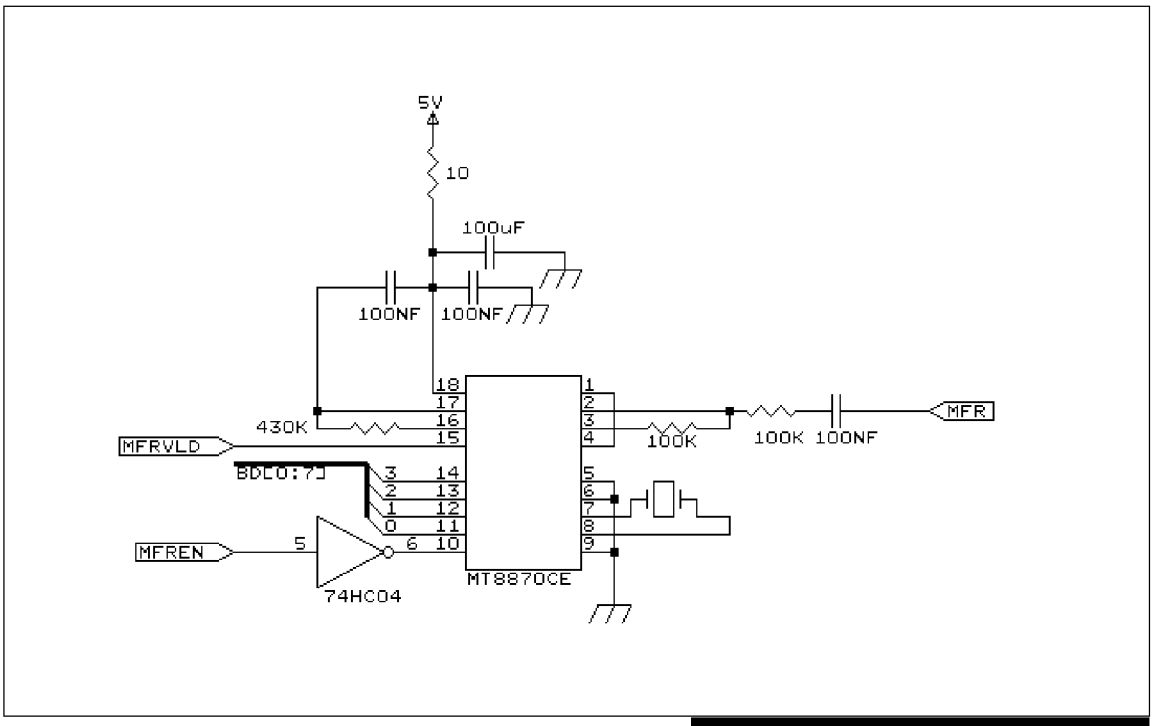
**KS58015 (TP5088)** is prepared for sending DTMF signals.
This device has five control terminals. One is for tone enable (TEN) and the others for DTMF signal selections to be generated. Those signal selections and tone enable can be approached through a latch.

The generated DTMF signal is amplified with the first and second amplifier to adjust the high and low frequency group level. The low cutoff frequency may be recommended about 300Hz and the high cutoff frequency may be 3400Hz.

1.2 K ohm is a source impedance of DTMF generator, which is specified at the regulations of tele-communication equipment. The resistance can be determined by measuring the AC impedance during DTMF sending.

# 2.7 DTMF RECEIVER CIRCUIT

The system is equipped with **DTMF receivers** for *detecting DTMF signal from SLT.*




**MFR CIRCUIT DIAGRAM**

**MT8870 (or KT3170)** is used for *receiving and decoding DTMF signals*.
This chip is a complete DTMF receiver integrating both of the band split filter and digital decoder functions. The valid input signal range of this chip is -29~+1.0 dBm.

When the system detects hook-off in SLT interfaces, DTMF receiver may be connected to Network with dial tone.

After receiving first digit, dial tone is disconnected and DTMF receiver continues to detect the digits from SLT or the specific lines. Those lines are to receive the addressing digits or prevent

the subscribers from dialing a toll.

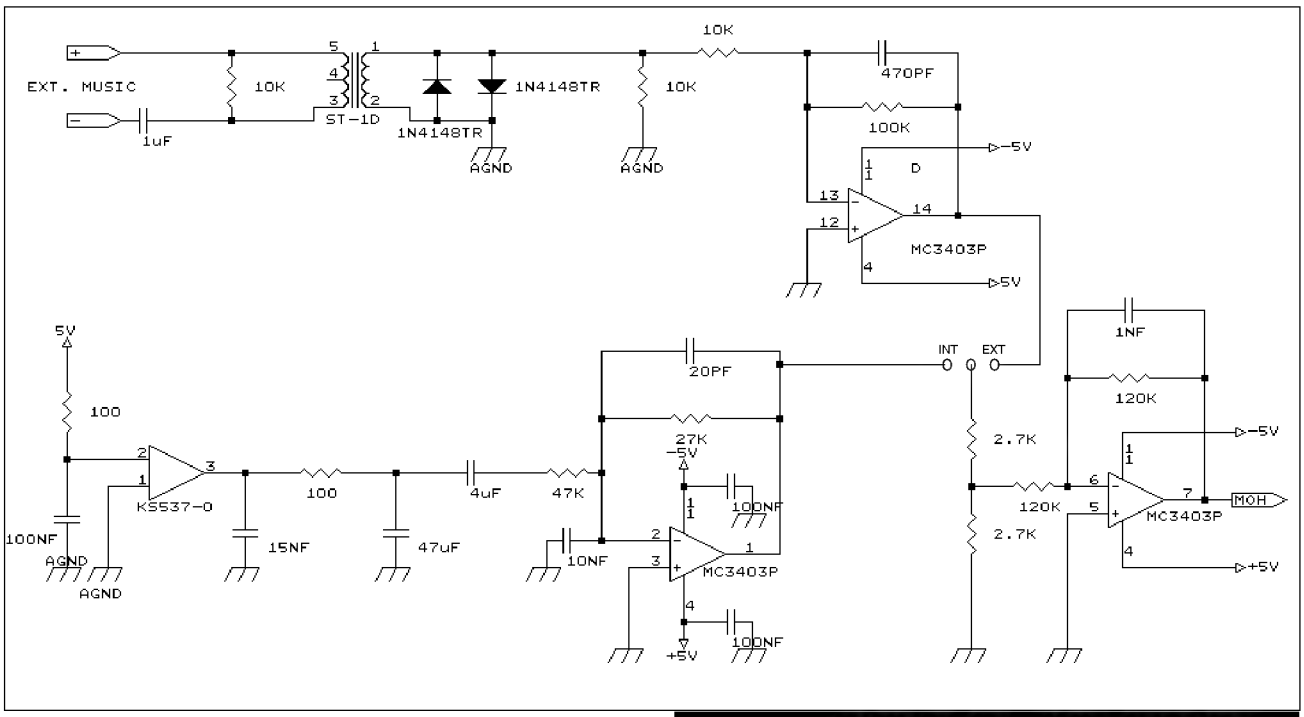
For Dial Pulse lines and telephones, the device will not operate.
CPU monitors periodically DTMF receivers whether they have detected any valid DTMF signal. MFRVLD signal is used to detect the valid signal that input is connected to STD pin of the receiver chip.

STD pin of the receiver may rise to HIGH when the chip receives a valid DTMF signal. After detecting STD, CPU can read the DTMF data registered in the chip by D0~D3 and MFREN signal.

# 2.8 MUSIC SOURCE CIRCUIT

The system is equipped with two kinds of music sources; *internal* and *external.* These two music sources are selected by shunt pin and connected to network.

The music source has two names; MOH (Music On Hold) and BGM (BackGround Music) according to its usage. MOH is the music provided on hold and BGM is the music heard at the keyset. But it is provided from the same source, the internal or the external music source.




**MUSIC SOURCE CIRCUIT DIAGRAM**

The internal music source is basically equipped in the system and is composed of the melody generator (KS537), and OP-AP.

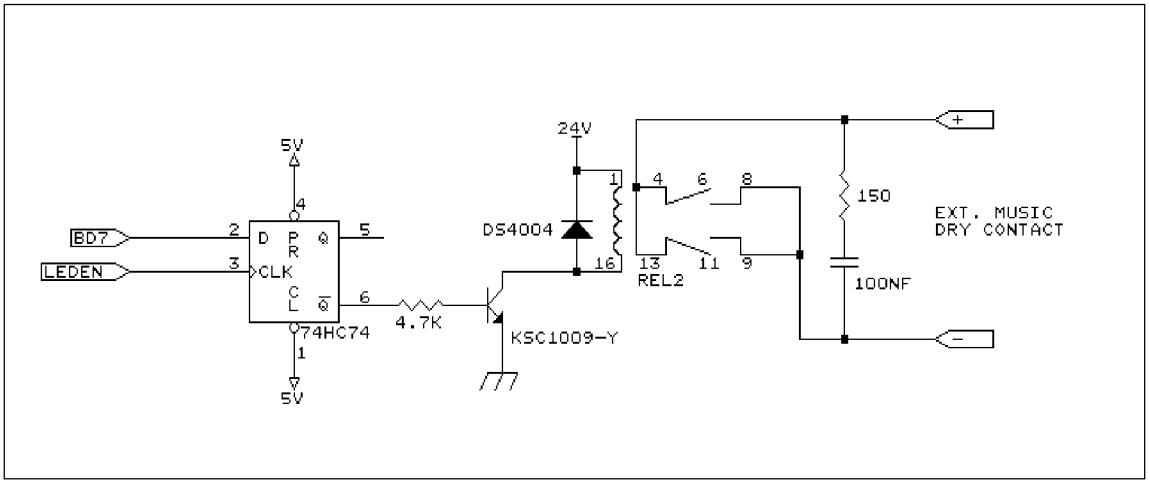
The Resistors (R209, R210) is connected to the output of INT/EXT MOH. For BGM, you should adjust the level at the keysets.

Following the resistors, a voltage follower is prepared for the low impedance source, which enables to apply the source to some of trunks or stations at the same time.

You can install the external music source for MOH or BGM, tape recorder or radio.
The External Music Source is connected to system with Audio Jack and interfaced with the isolation transformer and OP-AMP.

The transformer, ST-1D isolates the power between the external music source and the system. The transformer's turn ratio for impedance matching is 1:1.5.

Two Zener Diodes protect the network from over-voltage that may damage the network chips. The transferred signals via transformer are fed to OP-AMP input and the output of OP-AMP is connected to selected shunt pin.




One relay contact (REL2) is provided through the connects on the Base B'd. This contact is controlled by software. This relay is used as External Music Source power ON/OFF control.

# 2.9 DOOR-PHONE INTERFACE CIRCUIT

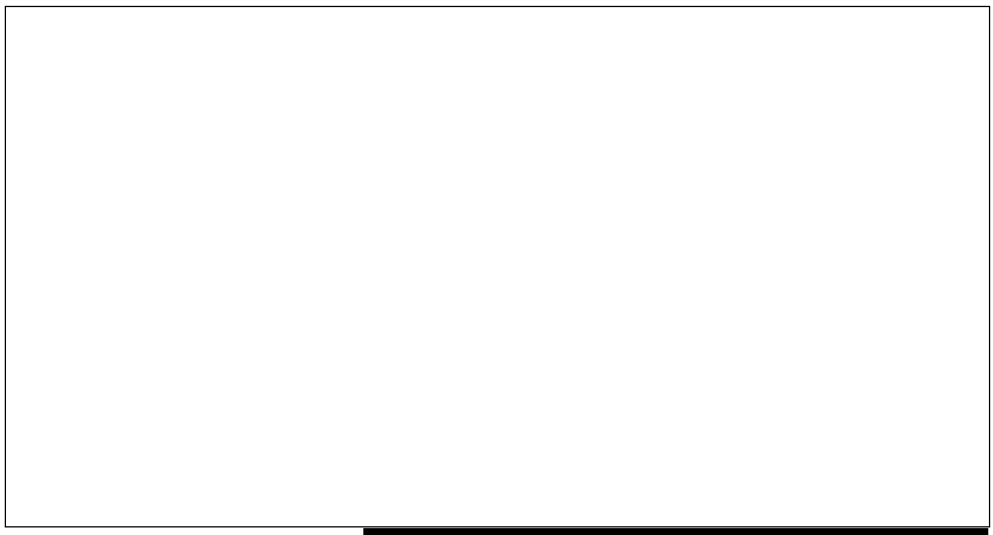
The system is equipped with two door-phone interfaces with lock release controls on the DPH/ PAGING D-B'd.

You cannot install any commercial door-phone to the system and only the 2-wire door-phone provided by SAMSUNG Electronics may be available.

Door-phone can be installed near the door or room for monitoring.
Two wires required to connect one door-phone and additional two wires may be required to control the door-lock if necessary.
All connections are accomplished through Modular Jack.

Two wires are for speech path and for the power to activate the door-phone. The speech path and power feeding circuit are very similar to SLT interface.

The opto-coupler chip detects the status of the call button at door-phone.
The user can make a call to door-phone and also receive a call from door-phone.

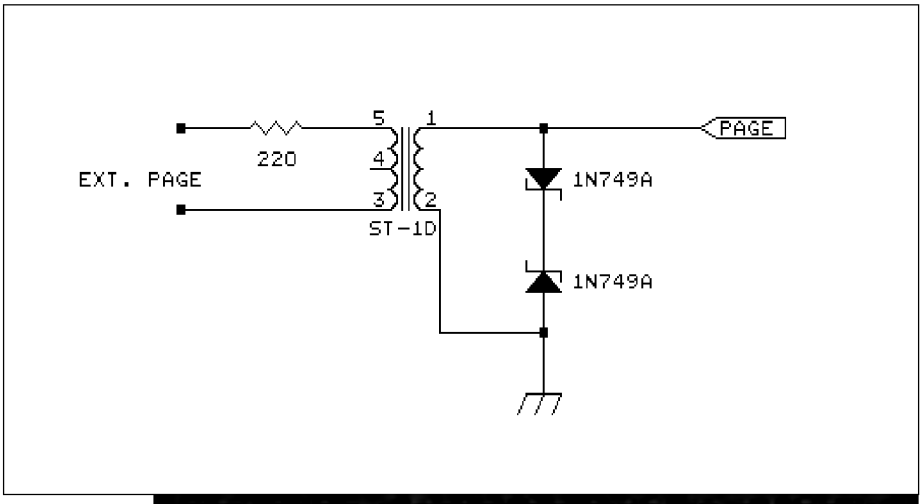


**DOOR-PHONE INTERFACE CIRCUIT**

The lock release control is composed of a relay and a spark killer. This controls two signal wires connected or disconnected. Enabling the control means that relay control contact is connected during the preprogrammed period.

# 2.10 EXTERNAL PAGE INTERFACE CIRCUIT

The system is equipped with the external page interface on the DPH/PAGING D-B*d which enables the subscriber to make a page through the external speaker.
The interface is simply composed as a power-isolated speech path and you should connect the external speaker with the amplifier. Otherwise, the level is too small to hear because the interface is not equipped with any speech driver.
The connection can be accomplished through Audio Jack.




**EXT. PAGE INTERFACE CIRCUIT DIAGRAM**

One transformer ST-1D for power isolation and Zener diodes for network protection from over-voltage are all to be required.

The interface does not have any level-adjust so you may adjust the level at the external amplifier.

# 2.11 CPU AND CONTROL LOGIC

CPU and Control logics exist in the main Base B'd and control all of the system operations and features.

They are composed of CPU, reset circuitry, memory and decoders.

## 2.11.1 CPU(Central Process Unit)

NX system is equipped with **HD64180R** as its CPU that is supplied by Hitachi.
The **HD64180** combines a high performance CPU core with many of the systems and I/O resources.

The five functional blocks of the CPU core are; (• : using part)

- • Clock Generator
- ○ Bus state Controller
- ○ Interrupt Controller
- • Memory Management Controller (MMU)
- • Central Process Unit (8-bit CPU)

The integrated I/O resources comprise the remaining four functional blocks; (• : using part)

- ○ DMA Controller (DMAD - two channels)
- • Asynchronous Serial communication Interface (ASCI - two channels)
- ○ Clocked Serial I/O port (CSI/O - one channel)
- • Programmable Reload Timer (PRT - two channels)

The system clock is provided by 12.288 MHz crystal, and it's one machine cycle is about 160 nanoseconds that results from the system clock divided by 2.
For good oscillation without distortion, two bypass capacitors are attached to the terminal of the crystal.

This CPU has the internal oscillation circuit and any additional oscillator may not be required. CPU operates with +5V power, system clock and reset-free. You may check the three factors if you have any troubles.

This chip supports 512 Kbytes Memory and 64 Kbytes I/O Address space.

## 2.11.2 Reset Circuit

To protect CPU from an electrical shock or trap, a reset circuitry may be needed, which is generally composed of a voltage level detector and a watch-dog circuit.

The reset circuitry of the system consists of a micro-monitor chip **DS1232**.

DS1232 Chip monitors two vital conditions of CPU; Power supply level variation and watch-dog timer.
This circuitry is designed to supply power ON signal (500 msec) to the CPU when turning the system ON and the level of +5V power is over 4.5V. Before turning on the power, the power tolerance of DS1232 (TOL pin) must be connected to +5V.
The purposes of the **Power-On Reset** is;

- To initialize the essential hardware (CPU, Relay driver and some logics, etc.) of the system when turning the power ON.
- To prevent all the components from misoperating.

### 2.11.2.1 Voltage Level Detector

Level detector detects the variation of +5V and. It resets CPU. Its memory logic and another logic part for protection, if that power is under-range.

The level detector protects CPU and Memory back-up data from power variation, which stabilizes the CPU operation and enhances the system reliability.

DS1232 Chip detects the +5V power and resets the system when the power is under + 4.5V.
The Push-button reset (PB input Pin) of DS1232 checks the +28V power that is driven by the first output of AC/DC converter, resets the system and operates the POWER LED of LED indicators.

The ALR8054 checks the variation of +28V power using the resistors that divide the voltage.
The Reset signal is released then the +28V power is over +20V and supplied to halt the system when the power is under +16V.

Therefore, the system is designed to operate when the stable power (over +20V) is supplied and reset when unstable power (under +16V) is supplied. That protects the system from misoperating. Users can easily detect this feature through the POWER LED of LED indicators.

### 2.11.2.2 Watch-dog Circuit

A watch-dog circuit monitors the CPU operation and resets CPU if an abnormal status is detected to prevent from the unpredicted program trap or circuit trap.

Watch-dog circuit is in the micro-monitor chip DS1232. If there is no strobe signal within 1 sec at Pin 7 of DS1232, the Reset signal is generated at Pin 5 (RST) and Pin 6 (RST).

The system program memory consists of program memory and data memory. The system program memory of all the NX systems is 256 Kbyte EPROM (27C020). The system data memory is 32 Kbyte SRAM (62256) or 128 Kbyte SRAM(681000). The NX-308 system uses one SRAM (32 Kbytes) and the NX-820 and NX-1232 systems use one SRAM (128 Kbytes) for system data memory.

Program memory has all instructions for system operations. Data memory has all data to control and to be programmed by users. Data memory may be protected with back-up circuit when power fails.

Memory controls are activated only when the ME signal is low. I/O Controls are activated only when the IOE signal is low and the control signal is divided by some decoders.

# 2.12 RTC (Real Time Clock)

The system is equipped with a real time clock, **MSM6242BRS**, which provides the precise time base for the current time.

It has a one-chip oscillator for **32.768 Khz** crystal of which time base is divided to addressable 4-bit I/O data for seconds, minutes, Hours, Day of week, Date, Month and Year.

The chip has two Chip-Selectors; One (CS, Pin 2) is activated in Low and connected to one output of the I/O decoder, and the other (CS, Pin 15) is activated in High that operates with level detector of Memory back-up. The second Chip Selector prevents the internal data from being damaged while power failure.

The time base of the real time clock while power failure, you should move the shunt pin (Memory back-up switch) on the main base B'd to ON position after installation.

To adjust good oscillation, chip is equipped with two fixed capacitors (20 pF).

# 2.13 MEMORY BACK-UP CIRCUIT

The memory back-up circuit protects **the data of back-up memory** and the **RTC(Real Time Clock)** while power fails.

The circuit consists of Ni-Cd battery, level detector, some gates and diodes, back-up ON/OFF switch (shunt pin) and some passive devices.

**You should move the shunt pin to ON position immediately after installation.** Otherwise, the data of back-up memory and RTC may be volatile while power fails.

The main device is the Ni-Cd battery, which is rechargeable battery and has a smaller capacity than lithium battery. The battery provides the maximum of 60 mAH and the capacity may decrease in proportion to time.

The main load to the back-up power is the power consumed at the static RAM and the real time clock chip.
Considered with the maximum load, the duration of the battery is about 18 days. In the typical situation, the duration can be up to 200 days. The difference is too large and it is difficult to test the practicable system.

Our factory guarantees seven days for the memory back-up.

# 2.14 CPD (CALL PROGRESS DECODER)

**CPD (Call Progress Decoder)** monitors the call during automatic redial or the busy tone during conversation.

This decoder is optional feature on the DPH/PAGING D-B'd.

The system provides automatic redial feature that enables to repeat the outgoing call automatically if the opposite party is busy. CPD enables the system to detect that the receiving signal is busy tone or not.

The system is equipped with SSI75T980 for call progress decoder. on the DPH/PAGING D-B'd. The system provides automatic redial feature that enables to repeat the outgoing call automatically if the opposite party is busy. CPD enables the system to detect that the receiving signal is busy tone or not.

The system is equipped with **SSI75T980** for call progress decoder.
The chip has eight pins for connection and detecting Dial Tone, Ringback Tone, Busy Tone or Reorder Tone by tone cadences.

The CPD has to be provided with the external crystal for reference frequency supply, which is driven by the internal oscillator. (3.579545 MHz crystal should be connected.)

# 2.15 VOICE ANNOUNCEMENT SERVICE CIRCUIT

This circuit is equipped only on the DPH/PAGING optional D-B'd, and used for the voice message features; **Record/Play the voice messages.**

The circuit consists of two ports for simultaneous servicing, 32 seconds voice-recording/playing feature that can be divided to four channels per port. Each channels is for the voice-announcement message and intercom message.

***For the voice-announcement message service***, the circuit mainly consists of ADPCM (Adaptive Delta Pulse Code Modulation) speech processor **MSM6258GS** and one **681000 (128 Kbyte) SRAM**.
The processor can record an analog signal to SRAM by ADPCM, and may reproduce the recorded signal. The integrated A/D and D/A converters (internally comprised), make the chip more self-contained, relieving the needs for external conversation circuitry. Additionally, the ADPCM samples the signal by 4 bit-length, and the number of recording phrases may be also selected in application. (Up to 4 phrases(channels))

***For signal recording***, the handset or the external MOH should be used, and the received signal can be connected to the speech processor through the network, amplified, sampled and stored to SRAM.

***For signal reproducing***, the stored data are gotten from SRAM, converted to the analog signal, amplified and transmitted to network.
In the network, the signal may be switched to the trunk interface for sending the intercom voice

message or outside voice-announcement message.
Latch chip (74HC374) is applied to control recording/reproducing, selecting, starting, selecting channel and checking existence of VMS.

# 2.16 AC/DC CONVERTER

The system is equipped with AC to DC power supply for its operation.

**110 VAC or 220 VAC** are allowable of which frequency is 50 Hz or 60 Hz. The input power may be selected with the location of TAP Connector. And, the system has an ON/OFF control switch for connecting or dis-connecting the input power to the system.

AC input is composed of three terminals; *AC high, AC low*, and *Earth terminal.*

The earth terminal is provided from the local electric company or the electric transmission pole, which is used for the protection circuitry. To ground the system is very important for system protection from any damage, so the system provides the additional earth plug where the earth terminal of AC power is not surged.

The AC power through the ON/OFF control switch is fed to the AC power fuse and the protection circuitry. The fuse capacity is 1A, 250V and protects from the input over-voltage and the output shortage.

The **protection circuitry** is composed of **3 varistors**, which enhance the system noise and surge blocking. The varistor is applied differently as the input voltage; 470 V varistor for 220 VAC and 220 V varistor for 110 VAC. The varistor is parallel connected between AC high and AC low terminal for the normal mode protection. Any over-voltage input is clipped to the level of the varistor and the fuse may operate to blow at that case. Another varistor is installed between AC low and the earth for the common mode protection of which clipping level is 420 volt. Any over 420 V input in common mode will be stuck to the earth and the power fuse blows at that case. As above, the circuitry protects the system from any over voltage of the AC power input.

The power through the protection circuitry is fed to the **power transformer**. The power transformer isolates the output from the input and provides the output according to the turn rati o. The primary turn is center-tapped for the reception of the input based on the power level. Full turn is for 220 VAC input and the center-tapped terminal is connected to 110 VAC input. The secondary turn is separated to two parts; one for the main power source and the other for charging the external battery. The output of the main secondary turn is also a sine wave, which is fully rectified by the following bridge diode. The rectified wave is regulated by the large capacitance capacitor (10000 UF/50 V). With the capacitor, the waveform is as DC and the regulation is some different as the load variation, which has a little power signal as a rippl e.

Therefore, the output is regulated again to the SLT DC Feeding circuit.

The AC/DC conversion is accomplished with the power transformer and the output is directly affected by the variation of the input power level. Some of the high frequency noises may be prevented to be transferred. But the AC level (50/60 Hz) is an important factor in this circuit,

because the power level is some deviated at the site according to their electric transmission center or the distance. And the output may fall as the load increases.

For stabilizing the system from the line voltage and load variation, the main secondary turn provides the additional supply that can be controlled with a relay. The relay is driven by the compare (**MC1458**) of which the detection level is determined as following;

> The reference voltage is varied as the output. If the output is high, the reference voltage is the sum of the zener voltage and two forward diode voltages, about 7.1 volt. If the output is low, the reference voltage is the value of the zener voltage minus two forward diode voltages, about 5.3 volt. The high and low threshold voltage is different because of the reference variation.

The input of the comparator is fed from the regulated output. The calculated value may be varied according to the component tolerance a little.

After power up, the relay turns ON to provide the sufficient power. And, the relay might be OFF when the regulated output rises up to the high threshold voltage (34.8V). Owing to the line voltage and the load, the regulated output may decrease down to the low threshold voltage (26.0V). Then, the relay will be driven to ON for the sufficient supply.

One fourth of the main secondary turn is added when the relay turns ON. Therefore, the output will be added to 25% increase compared with the current level.

For the secondary output compensation, MC1458 is used as comparator. Zener diode with four signal diodes provides the high/low threshold voltage. Resistor R16 gives the Zener current, resistor R13 provides the signal diode with forwad current, and the resistor R17 and R22 feed the input variation to the inverting terminal of the comparator. The diode for rectification (1N400 4) prevents the inverse electro-motive force from affecting the driver and the transistor (C1009Y) drives the relay directly.

As already explained, the regulated output may have a ripple according to the line voltage and load. It may be called as semi-regulated DC. The output is fed to Connection B'd.

# 2.17 SYSTEM BACK-UP INTERFACE

The system may continue the full system operation during AC power failure or "brown-outs" when a 24V battery supply is connected. At the Power Supply board charging and discharging circuits are prepared for the external battery. The system back-up interface is composed of **battery charge circuit, battery discharge circuit,** and **protection circuit.**

## 2.17.1 Battery Charge Circuit

Battery Charge Circuit is for charging the battery while AC power fed.

At first, a switch is prepared to control the path of charging. The path switch is composed of a transistor (TIP42C) and resistor R33 (1.8K). If the transistor turns ON, the external battery can be charged. Otherwise, charging process may be clocked owing the large resistance of R33.
A low level input to the transistor can be driven by the comparator, LM393.

The driving point may be decided as following;

The inverting terminal is provided with a reference voltage, 6.2 V of Zener voltage (1N 4735A). And the input is fed to the non-inverting terminal, which is provided from the battery through a signal diode, some resistors, and a variable resistor. With the structure of the circuit, you may get the detected level.

The transistor can be driven by the comparator of which the detected value is as above. In factory, it is recommended to adjust the level to 28.0V.
Therefore, the charging path is still connected until the battery level is over 28.0V, which protects the battery from over-charge. It is usually called as Over-Charge Protection Circuit.

After the over-charge protection switch is connected serially, which prevents over-current flow while charging. Because any over-current may interfere the main DC to fall and it may activate system restart.

The rectifier diode, 1N4004, prevents any reverse current flow while discharging or AC power failure.

The battery charge voltage is supplied from the sum of the main DC and the DC provided with the additional turn of the secondary turn. At normal, the additional turn and the following bridge diode and capacitor provide 6V DC. Therefore, the battery charge voltage is always higher than the main DC at the rate of 25% or 20% according to the power compensation relay.

## 2.17.2 Battery Discharge Circuit

Battery Discharge Circuit consists of a **power TR** and **rectifier diodes**.

The rectifier diodes, **1N5401** prevents any reverse current flow while there is no reason to discharge from the battery. The rectifier diode has larger capacity, 3A than 1N4004, 1A.

The **power TR** is driven by the comparator, LM393. High output turns the power TR OFF and the TR will be open. At this case, the discharge path is disconnected. Low output turns the power TR ON and the discharge path will be connected for the system to operate with the battery power.

The comparator output is determined by the input level. The non-inverting terminal is provided with the reference voltage by a zener diode and two signal diodes. The Zener diode provides 6.2V zener voltage and the signal diodes provide the hysteresis. Owing to the signal diodes, the reference level varies to 5.75V or 6.65V according to the comparator output. The additional comparing circuit with LM393 provides a driving current for the signal diodes.

The inverting terminal is provided with the battery voltage, which is adjusted to an adequate level divided by some resistors. The detection level may be known as following;

$$\textit{High Detected Level} \quad (VR + R15 + R25 + R21)\,(R25 + R21) * 6.65 + 1.1 = 24.6V$$

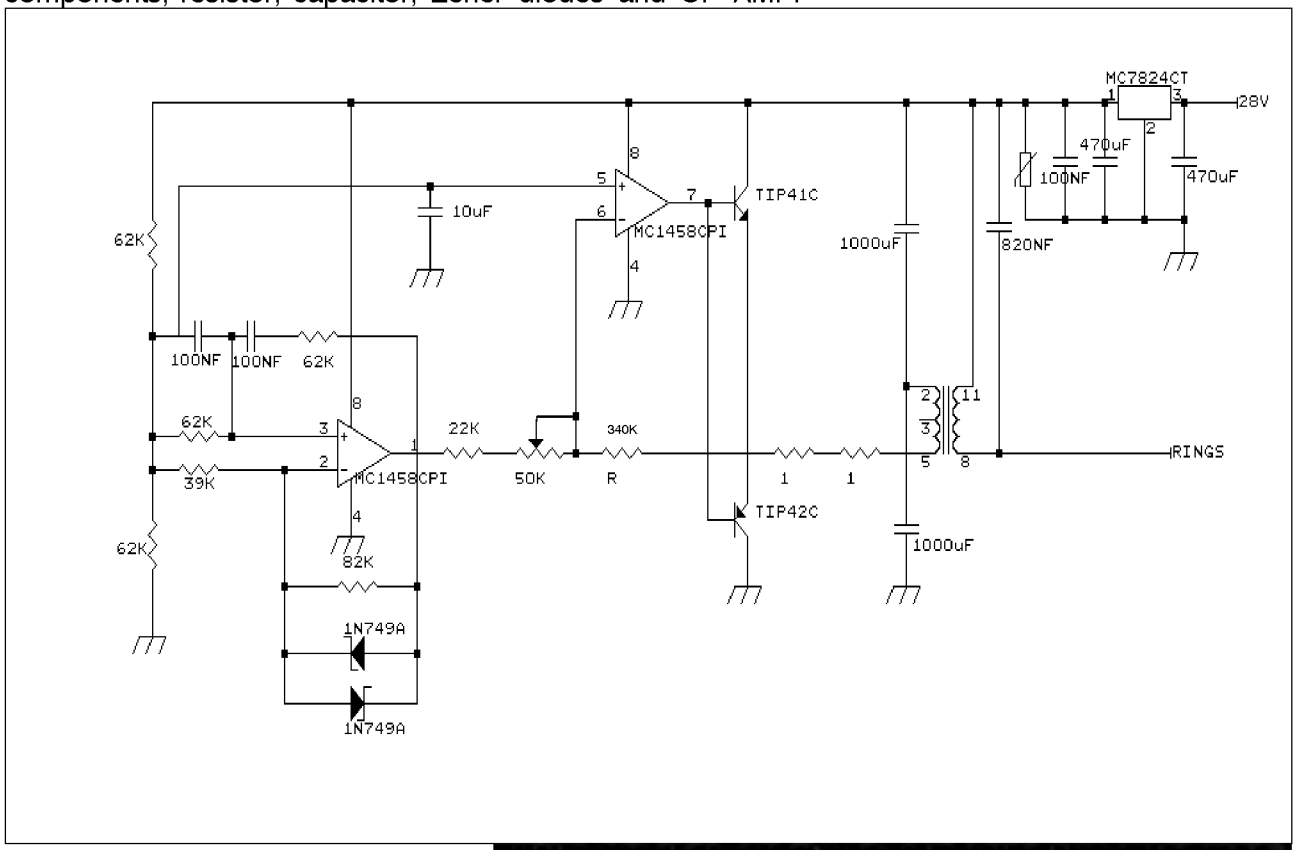
*Low Detected Level* $= \frac{(VR + R15 + R25 + R21)}{(R25 + R21)} * 5.75 + 1$
$= 21.4\ V$

At the above equation, the resistance of the variable resistor has one value because the value is already set while adjusting the over-charge protection level.

# 2.18 RING SIGNAL GENERATOR

Ring Signal is provided to single line telephones for on-hook signaling which indicates a call. The system provides 75 Vrms (25 Hz) which is sine wave signal. Ring signal generator has two parts; amplifier part and 25 Hz signal generation part.

25 Hz AC signal is generated by the **Wien Bridge oscillator** which is included other components, resistor, capacitor, Zener diodes and OP AMP.




**RING SIGNAL GENERATOR CIRCUIT DIAGRAM**

Another OP AMP amplifies 25 Hz AC signal which is generated by Wien Bridge oscillator. So, 25 Hz AC signal is generated and alternates the DC 24V power with TR.

Power transformer (SKP-RT) transforms to high voltage ring (AC 75 Vrms 25 Hz). And C18 capacitor is used for shortening to the load regulation.

The generated ring signal is transferred to the necessary SLT ports.

# 2.19 POWER REGULATOR

Regulated DC is provided for power feeding to single line telephones and tie lines. The main DC from power supply board can not be used owing to the ripple which results in the hum noise.

A simple linear technique is used for regulation. The transistor Q3 and Q5 are composed for darlington circuit to improve the gain and to decease the loss, which are the pass elements of the linear regulator. The zener diode ZD2 provides a reference voltage, and the resistors R32 and R24 give the feedback to control the pass element.

The output level is determined as following;

$$Output \quad \frac{(R32 + R24)}{R24} * (6.2 - 0.6)$$

$$23.8V$$

*(6.2 is the zener diode voltage and 0.6 is the BE voltage of transistor)*

The output voltage may vary from 22.8V to 24.9V according to the zener tolerance.

Generally, as already described, a linear regulator has a low efficiency and low noise output. But the linear regulator as this has a good efficiency owing to the small drop between the input and the output. In the regulation circuit, the largest factor to decrease the efficiency is the performance of pass element. The pass element is composed with darlington circuit to increase the gain, which enhances the performance and reduces the loss.

**Plus 12V regulator** uses the **linear technology** and all the necessary circuitry is combines to one chip **7812**, which is supplied by some semiconductor manufactures. For small power-consumed system, the linear technology is popular owing to the low price and the simple application circuit with the related chip. Only the input and output capacitors are necessary for the additional devices. Only the input and output capacitors are necessary for the additional devices. In addition, a small capacitance capacitor may be available because of the minute noise. The system uses the larger capacitance device for more stability but it is the designer*s groundless apprehensions.

For the +12V regulator, the main DC from power supply board is fed. The electrical characteristics of 7812CT are as follows;

- Maximum Input Voltage 35V
- Output Voltage 11.4V min., 12.0V typ., 12.6V max
- Line Regulation 13mV typ, 240mV max
- Load Regulation 46mV typ, 240mV max
- Quiescent Current 4.4mA typ, 8.0mA max
- Ripple Rejection 60dB typical
- Dropout Voltage 2.0V typical
- Output Resistance, 1Khz 18mohm
- Short Circuit Current 0.2A typical
- Peak Output Current 2.2A typical
- Temperature factor of output 1.0mV/C

+12V is mainly used for sending data to keysets and providing the power to door-phone.

**For ring generating,** a **linear regulator** (DC/DC converter) is used. The 7824 outputs the 24V DC, which is fed to the ring transformer. For a reference, the technology of power supply is largely divided to two; Linear regulator and Switching Regulator. The linear regulator has a low efficiency and noise and the switching regulator has a high efficiency and noise. And, the switching regulator is more expensive than the linear. We usually use two technologies mixed. The switching regulators are used for high-consumed power and the linear regulators are used for low-consumed power. To design and apply the switching regulators needs the high notice to reduce the noise.

# 3.TROUBLE SHOOTING

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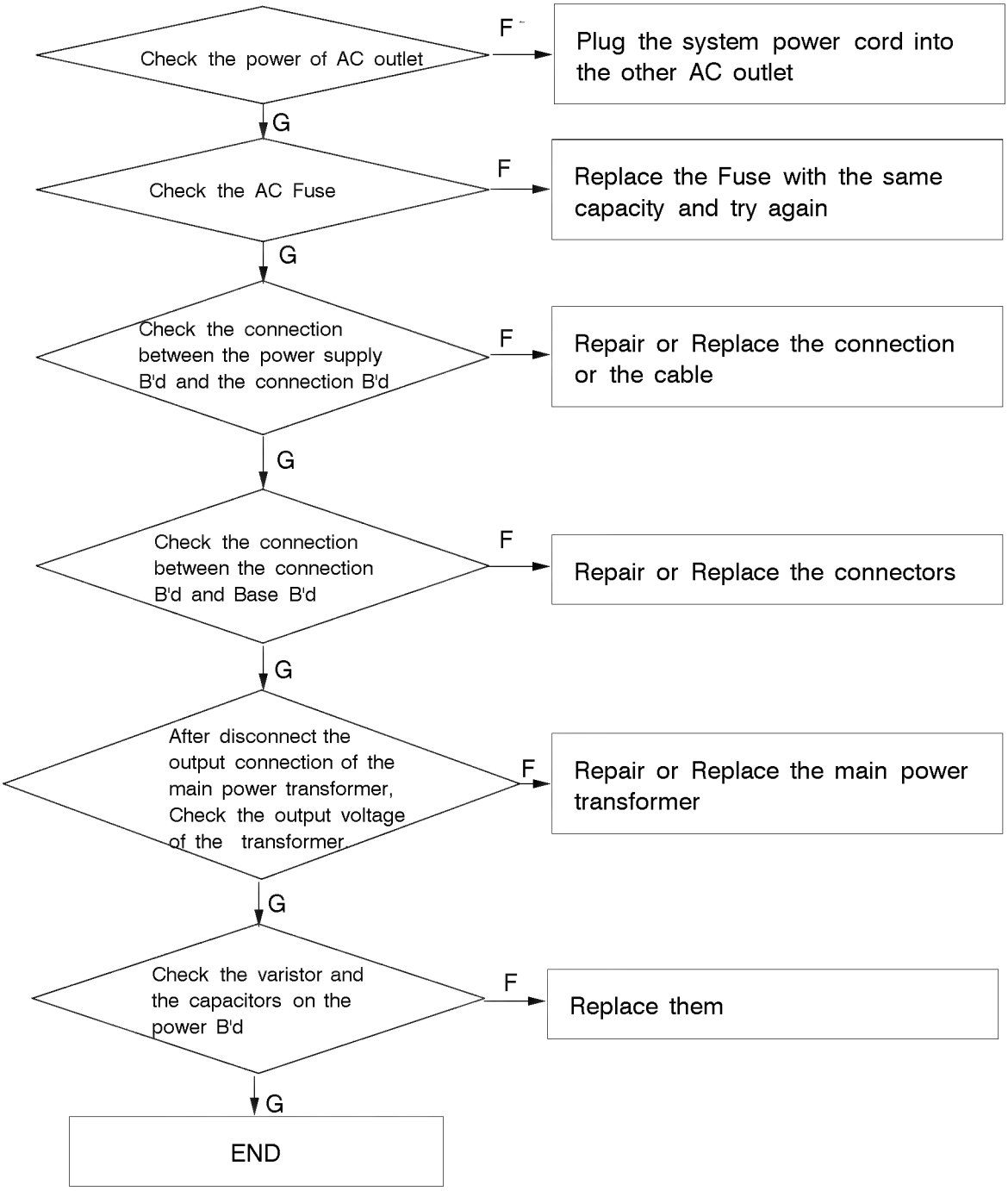
# 3. TROUBLE SHOOTING

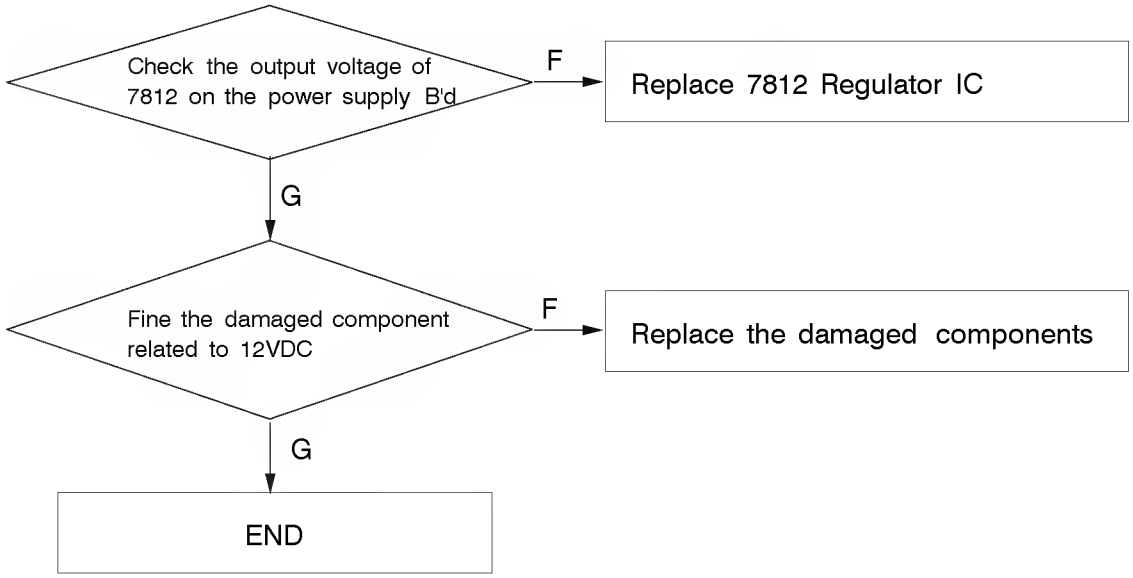
## 3.1 POWER PART

### 3.1.1 Main Power Failure with AC power


Check the power of AC outlet
F
Plug the system power cord into the other AC outlet
G
Check the AC Fuse
F
Replace the Fuse with the same capacity and try again
G
Check the connection between the power supply B'd and the connection B'd
F
Repair or Replace the connection or the cable
G
Check the connection between the connection B'd and Base B'd
F
Repair or Replace the connectors
G
After disconnect the output connection of the main power transformer, Check the output voltage of the transformer
F
Repair or Replace the main power transformer
G
Check the varistor and the capacitors on the power B'd
F
Replace them
G
END

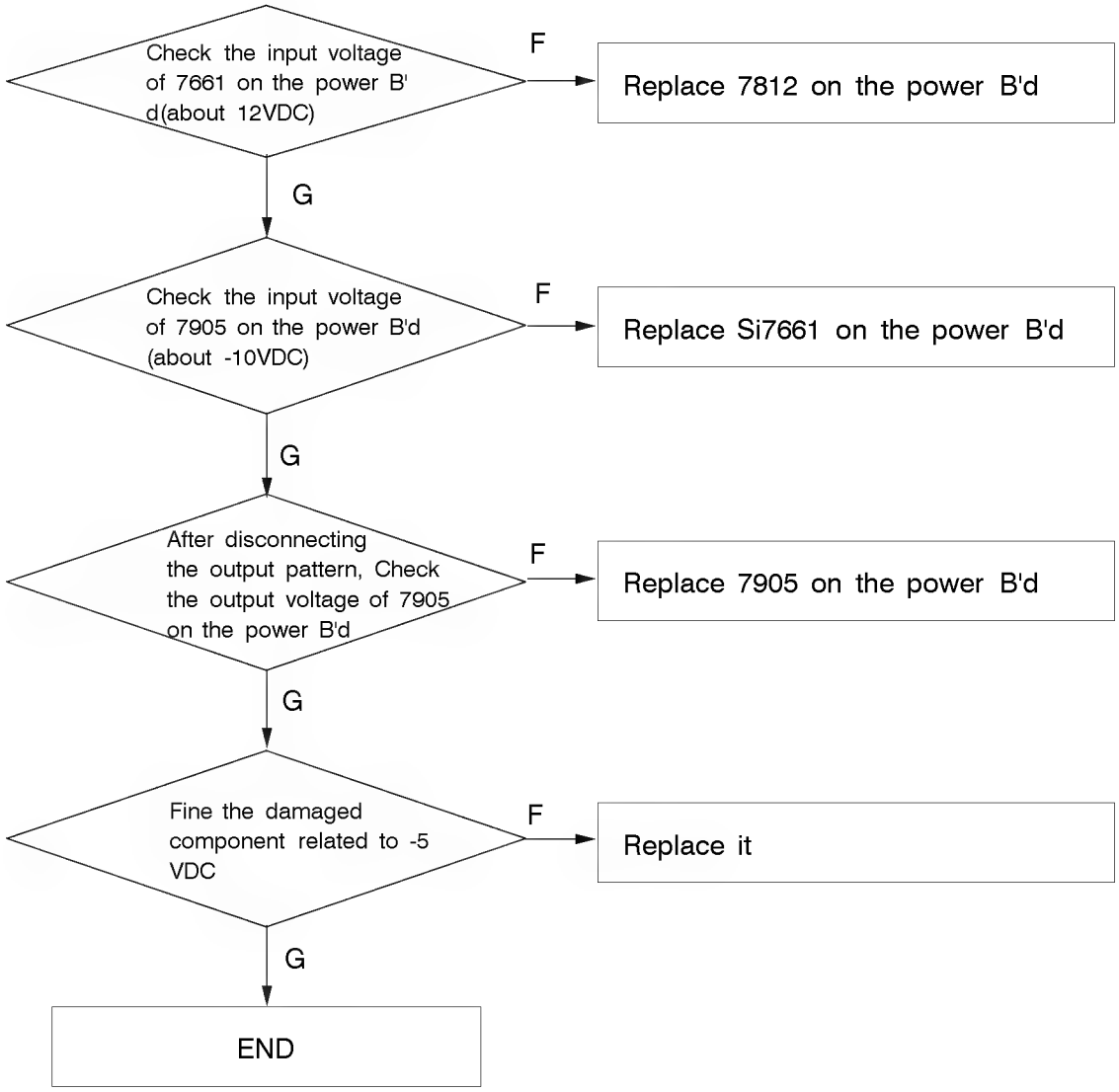
Y : Yes
N : No
G : Good
F : Fail

## 3.1.2 12VDC Power- Failure



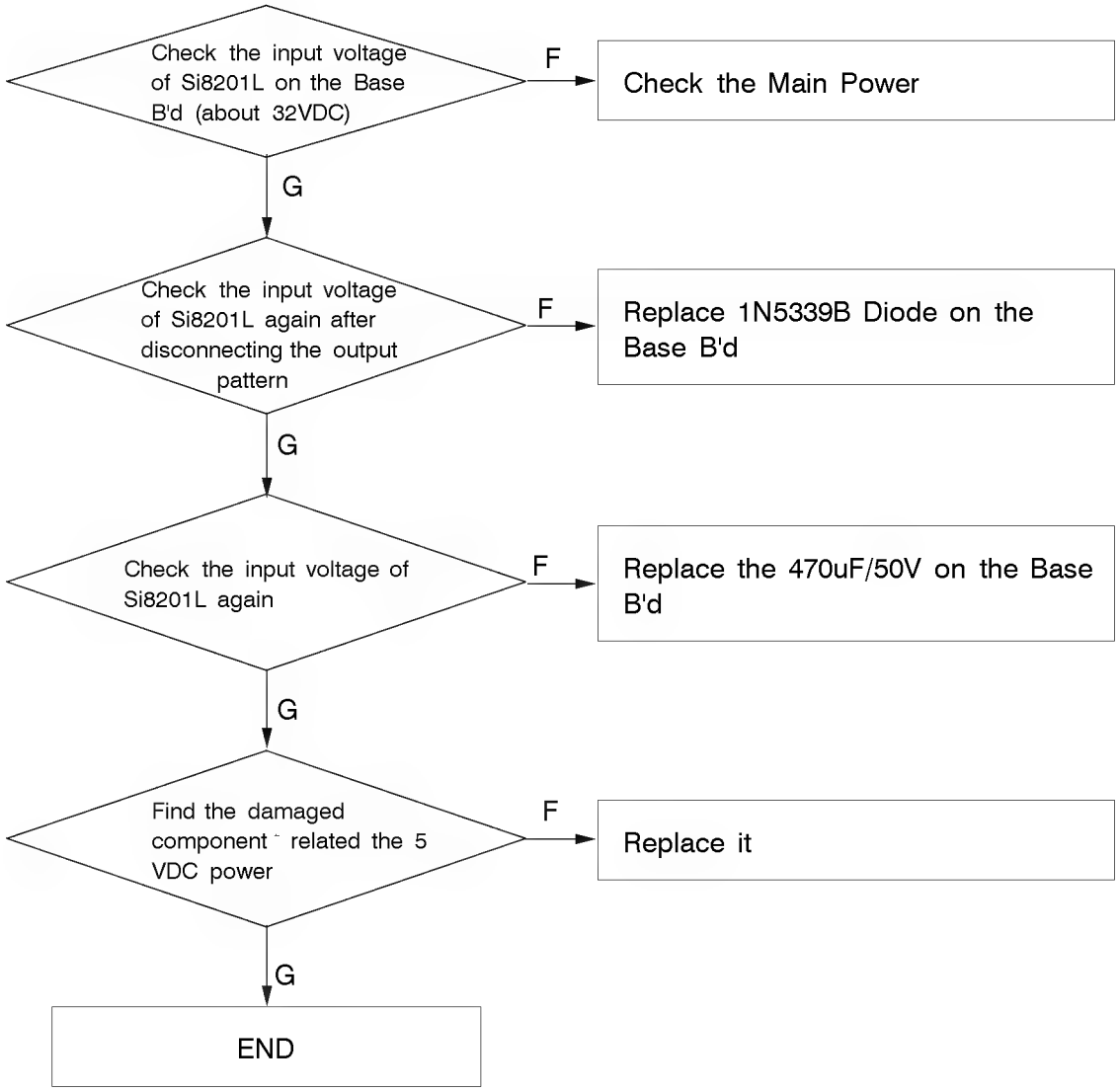

- This power is fed to keyset data-communication circuitry

## 3.1.3 -5VDC Power* Failure


Check the input voltage of 7661 on the power B'd(about 12VDC)
F
Replace 7812 on the power B'd
G
Check the input voltage of 7905 on the power B'd (about -10VDC)
F
Replace Si7661 on the power B'd
G
After disconnecting the output pattern, Check the output voltage of 7905 on the power B'd
F
Replace 7905 on the power B'd
G
Fine the damaged component related to -5 VDC
F
Replace it
G
END

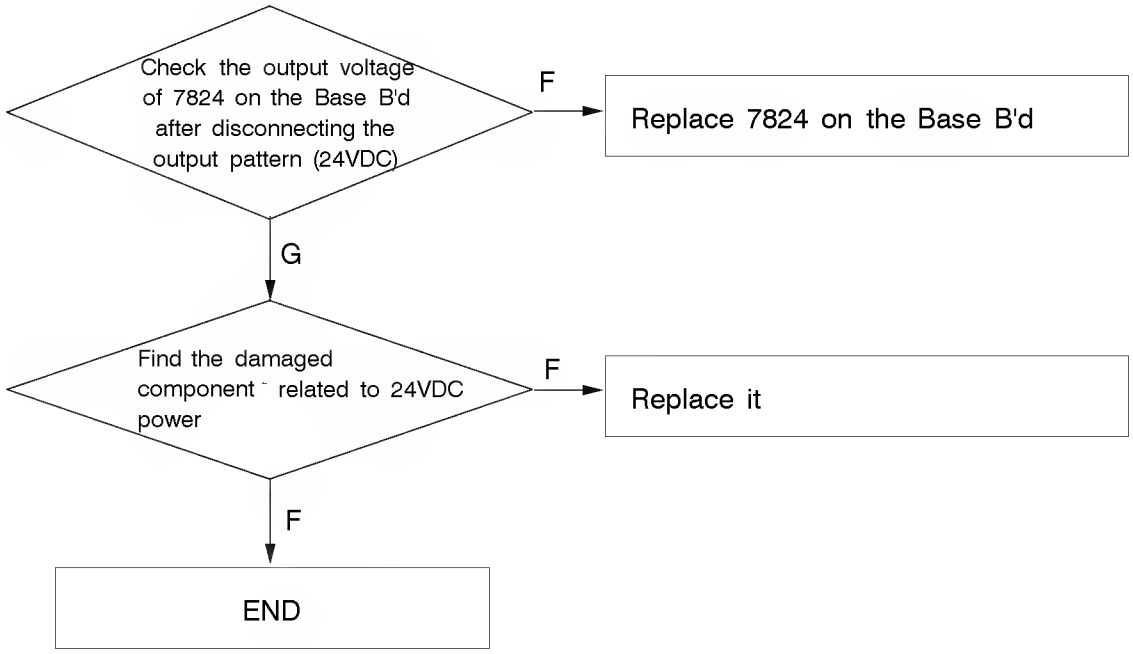
* This power is fed to network, speech circuitry

## 3.1.4 +5VDC Power Failure


Check the input voltage of Si8201L on the Base B'd (about 32VDC)
F
Check the Main Power
G
Check the input voltage of Si8201L again after disconnecting the output pattern
F
Replace 1N5339B Diode on the Base B'd
G
Check the input voltage of Si8201L again
F
Replace the 470uF/50V on the Base B'd
G
Find the damaged component * related the 5 VDC power
F
Replace it
G
END

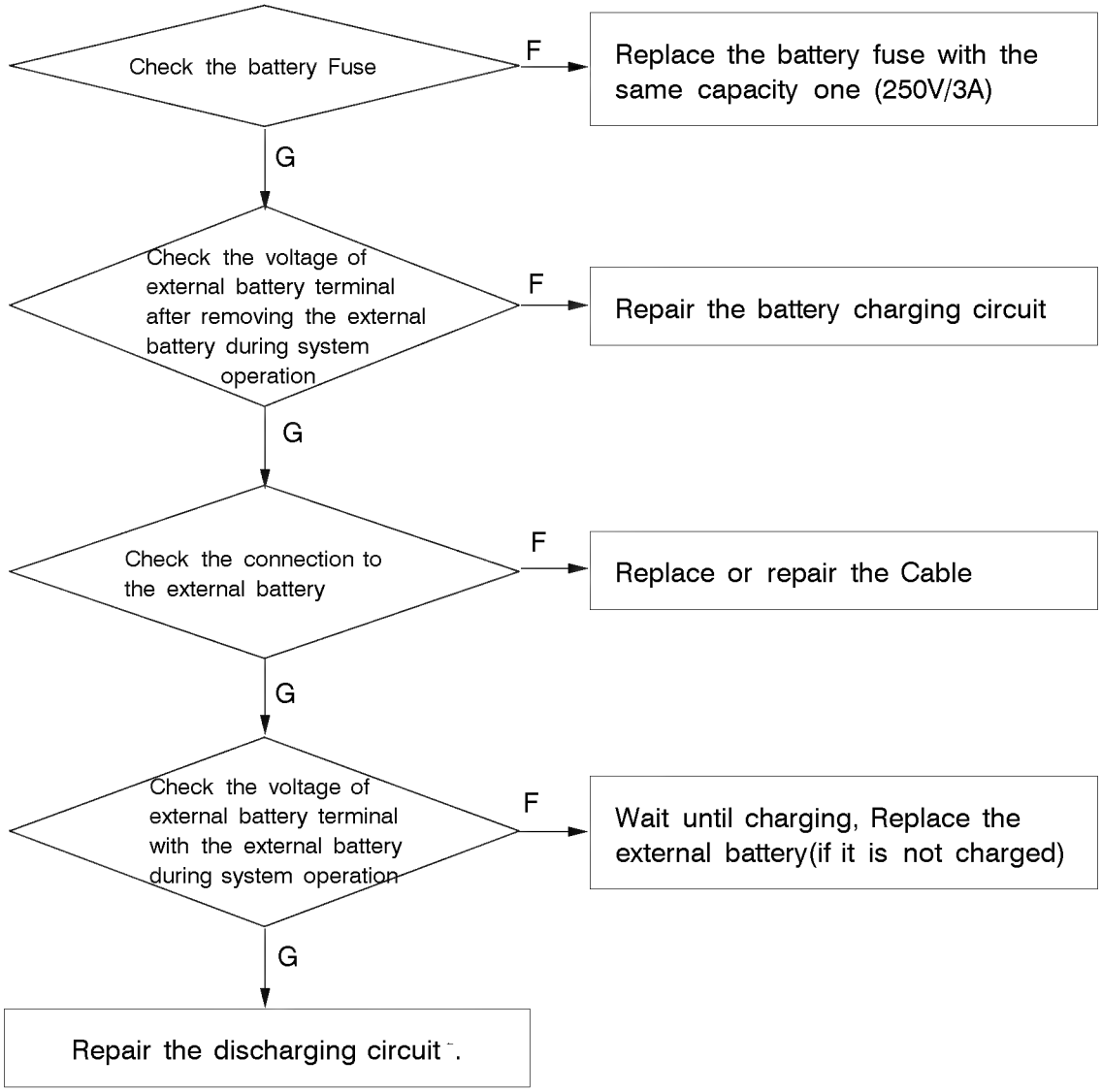
* This job requires so much time. Approach to the logic chips first near the regulator

## 3.1.5 24VDC Power Failure


Check the output voltage of 7824 on the Base B'd after disconnecting the output pattern (24VDC)
F
Replace 7824 on the Base B'd
G
Find the damaged component ¨ related to 24VDC power
F
Replace it
F
END

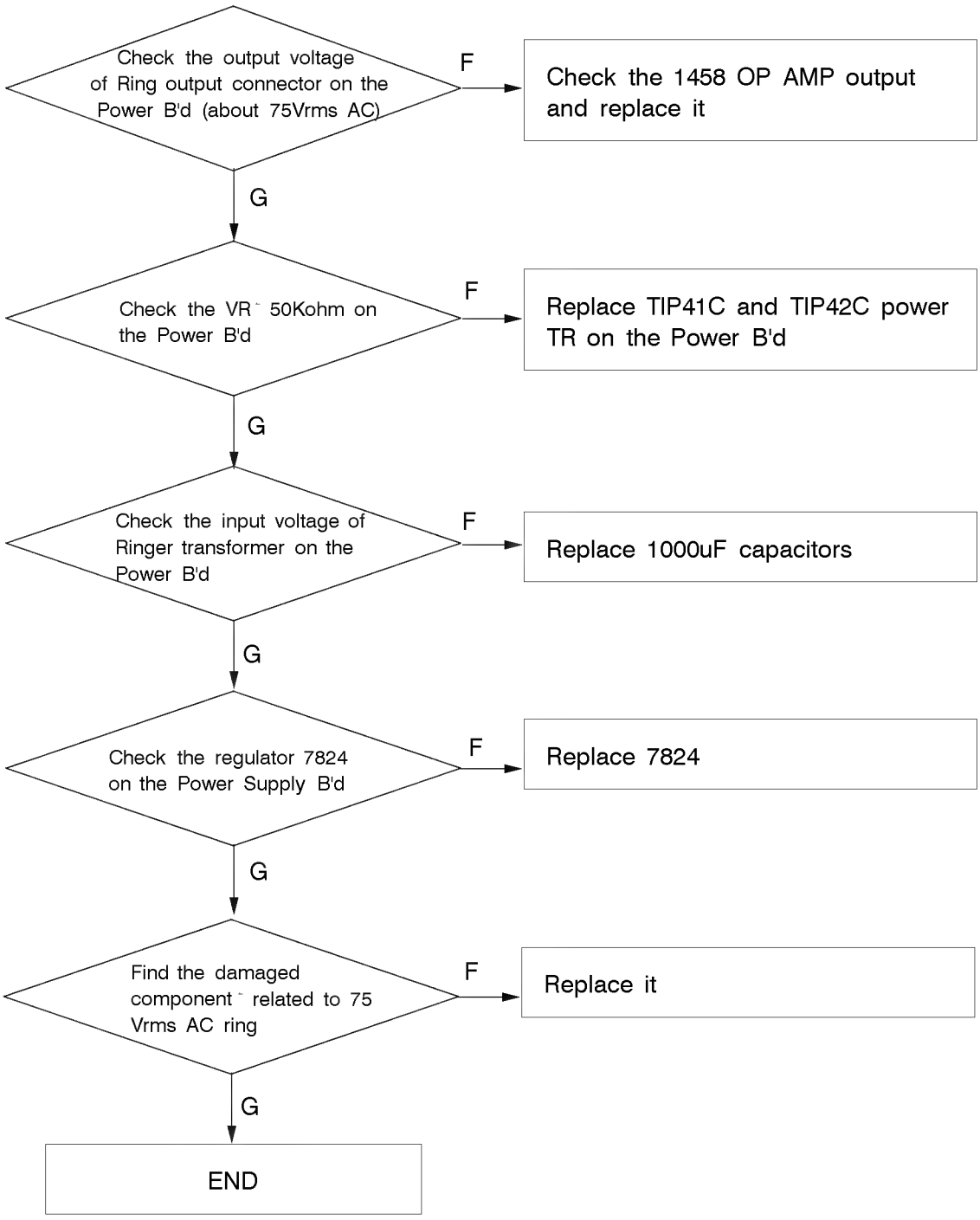
¨ This job requires so much time. Approach to the by-pass capacitors and transistors for relay drive

## 3.1.6 System Back-up Failure


Check the battery Fuse
F
Replace the battery fuse with the same capacity one (250V/3A)
G
Check the voltage of external battery terminal after removing the external battery during system operation
F
Repair the battery charging circuit
G
Check the connection to the external battery
F
Replace or repair the Cable
G
Check the voltage of external battery terminal with the external battery during system operation
F
Wait until charging, Replace the external battery(if it is not charged)
G
Repair the discharging circuit ¨.

¨ Refer to the circuit description

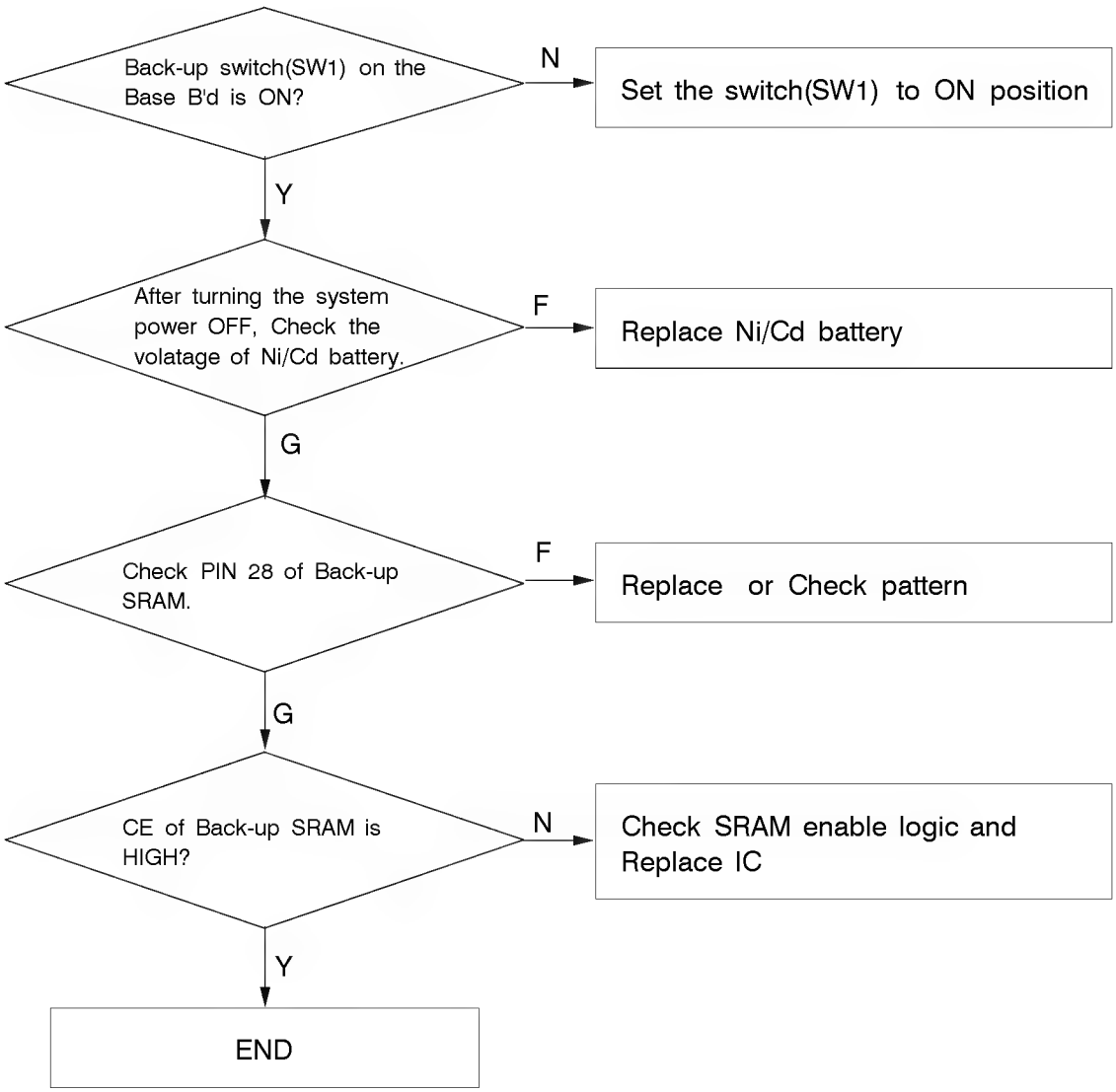
## 3.1.7 Ring Generator Failure


Check the output voltage of Ring output connector on the Power B'd (about 75Vrms AC)
F
Check the 1458 OP AMP output and replace it
G
Check the VR* 50Kohm on the Power B'd
F
Replace TIP41C and TIP42C power TR on the Power B'd
G
Check the input voltage of Ringer transformer on the Power B'd
F
Replace 1000uF capacitors
G
Check the regulator 7824 on the Power Supply B'd
F
Replace 7824
G
Find the damaged component* related to 75 Vrms AC ring
F
Replace it
G
END

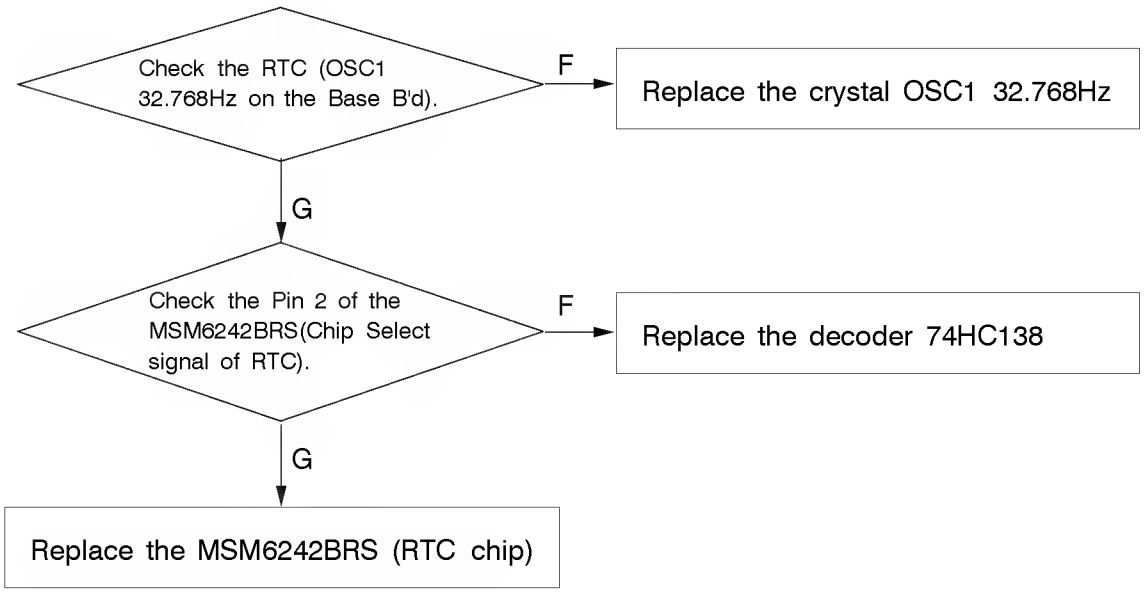
* VR adjustment : Turning the VR to left, VR has 50 Kohm resistance. That resistance makes the ringer voltage 0V. Oppositely, turning the VR to right, VR becomes 0 ohm and the ringer voltage becomes 80 Vrms/25Hz
* Approach to the SLC Feeding Hybrid chips SLC03A on the Base B'd or Expansion B'd 4SLC and 8SLC.

# 3.2 CONTROL PART

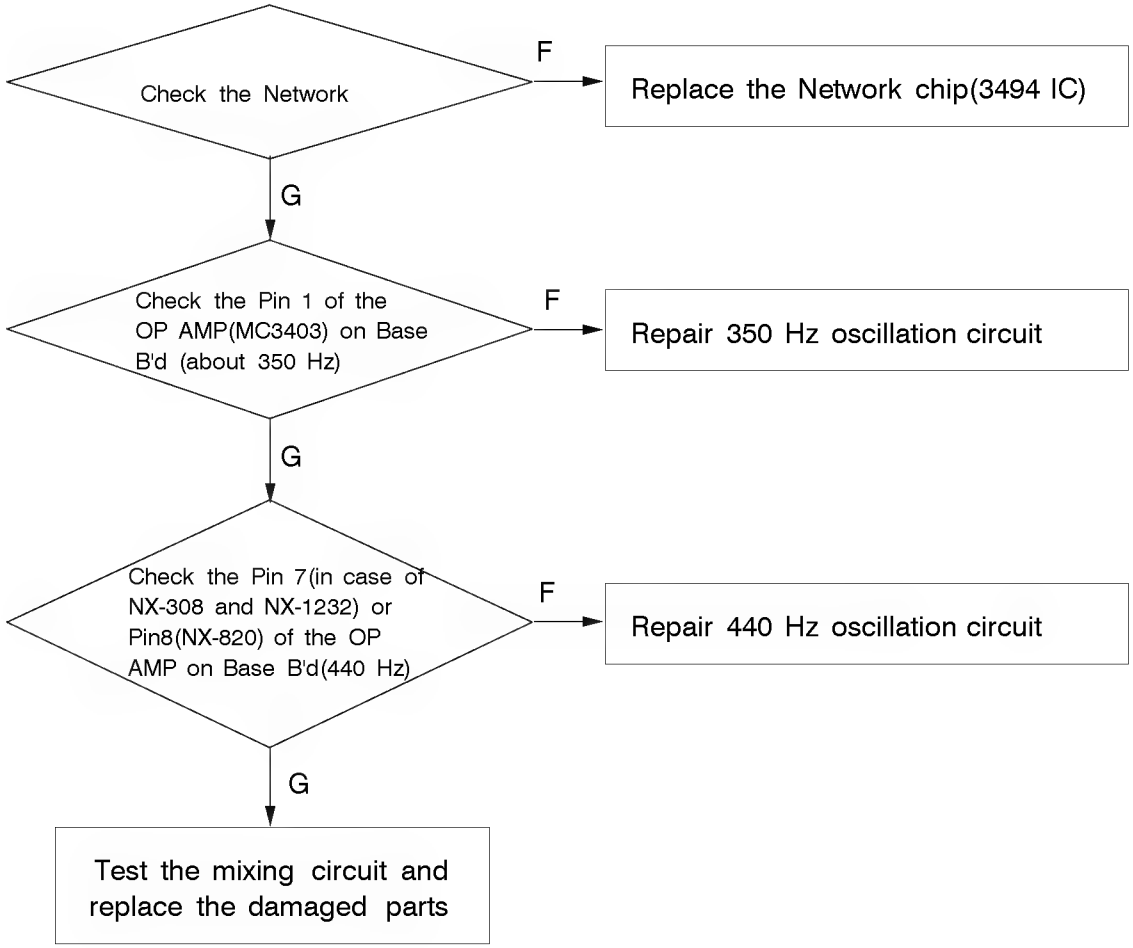
## 3.2.1 Memory Back-up Failure



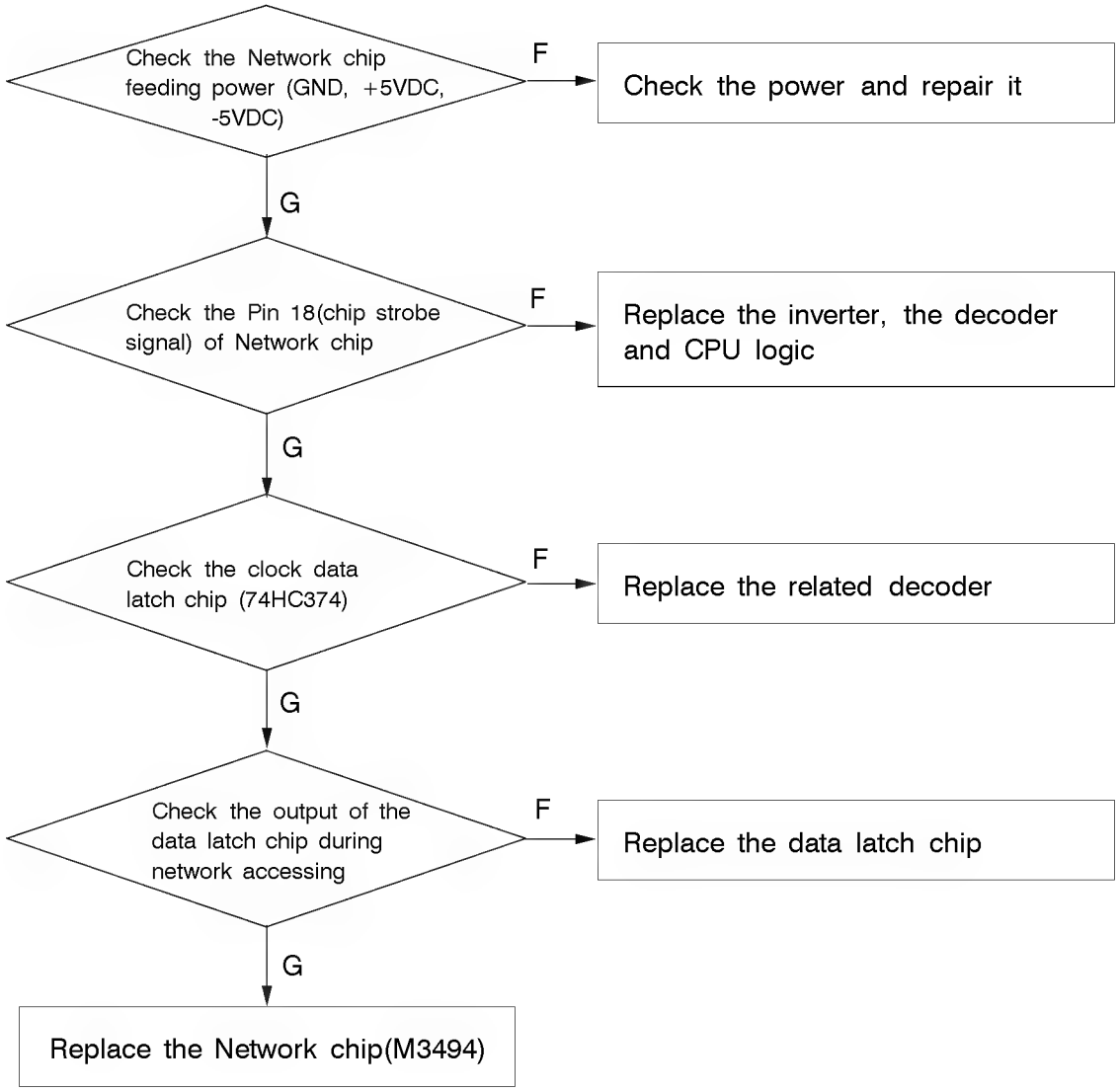
## 3.2.2 Real Time Clock(RTC) Failure


Check the RTC (OSC1 32.768Hz on the Base B'd).
F
Replace the crystal OSC1 32.768Hz
G
Check the Pin 2 of the MSM6242BRS(Chip Select signal of RTC).
F
Replace the decoder 74HC138
G
Replace the MSM6242BRS (RTC chip)

## 3.2.3 Tone Generation Failure

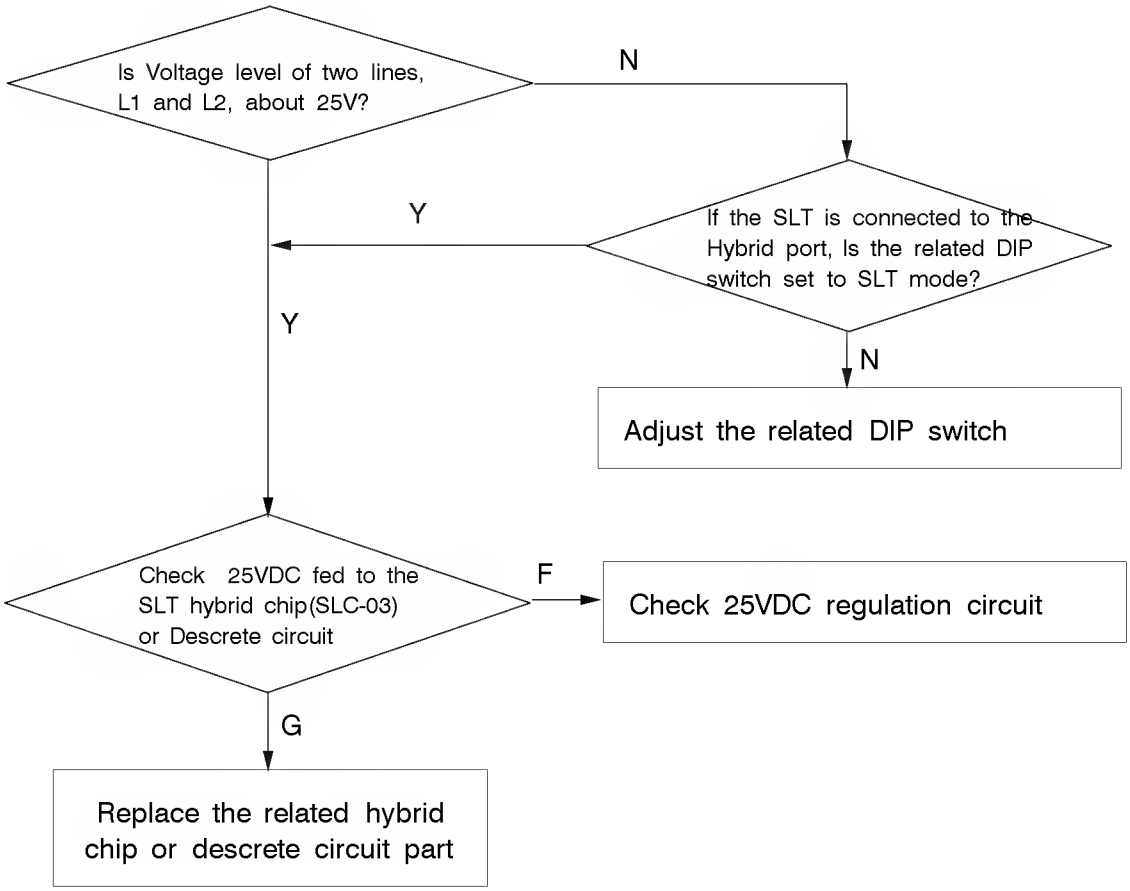

Check the Network
F
Replace the Network chip(3494 IC)
G
Check the Pin 1 of the OP AMP(MC3403) on Base B'd (about 350 Hz)
F
Repair 350 Hz oscillation circuit
G
Check the Pin 7(in case of NX-308 and NX-1232) or Pin8(NX-820) of the OP AMP on Base B'd(440 Hz)
F
Repair 440 Hz oscillation circuit
G
Test the mixing circuit and replace the damaged parts

## 3.2.4 Network Fault

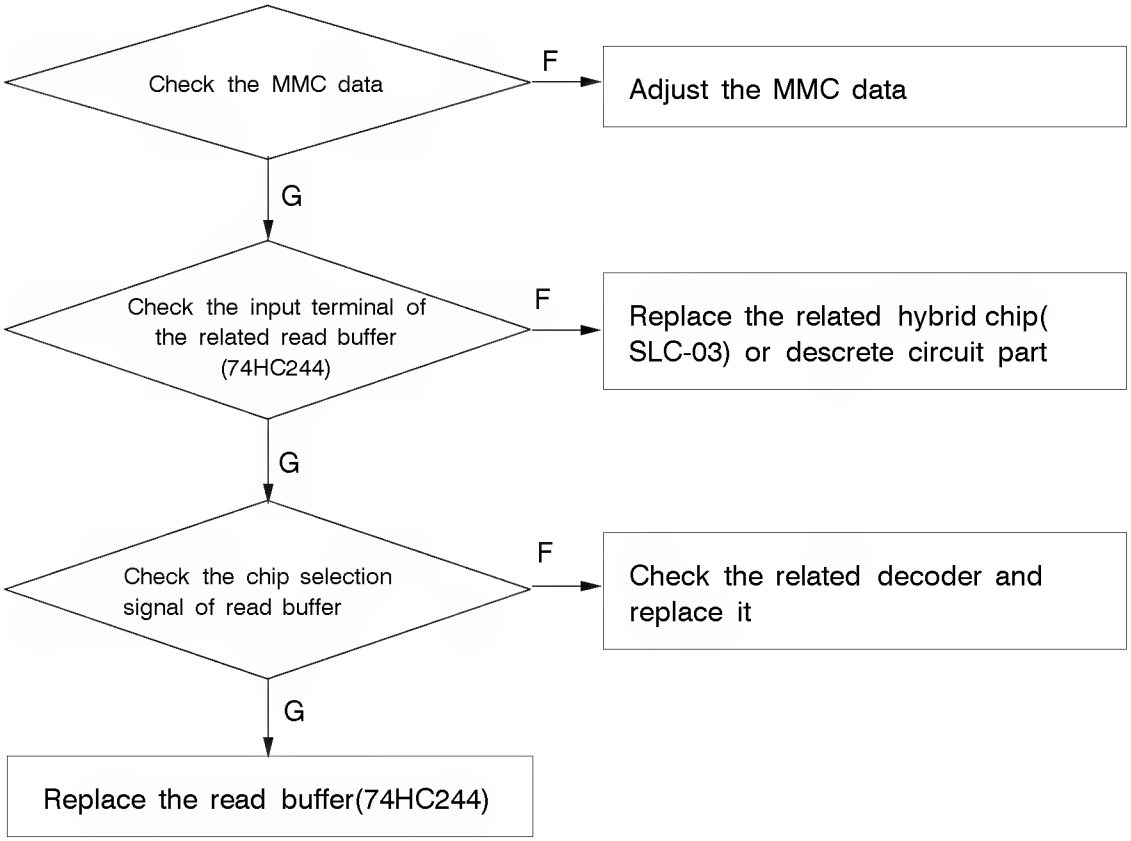

Check the Network chip feeding power (GND, +5VDC, -5VDC)
F
Check the power and repair it
G
Check the Pin 18(chip strobe signal) of Network chip
F
Replace the inverter, the decoder and CPU logic
G
Check the clock data latch chip (74HC374)
F
Replace the related decoder
G
Check the output of the data latch chip during network accessing
F
Replace the data latch chip
G
Replace the Network chip(M3494)

# 3.3 SLT PART

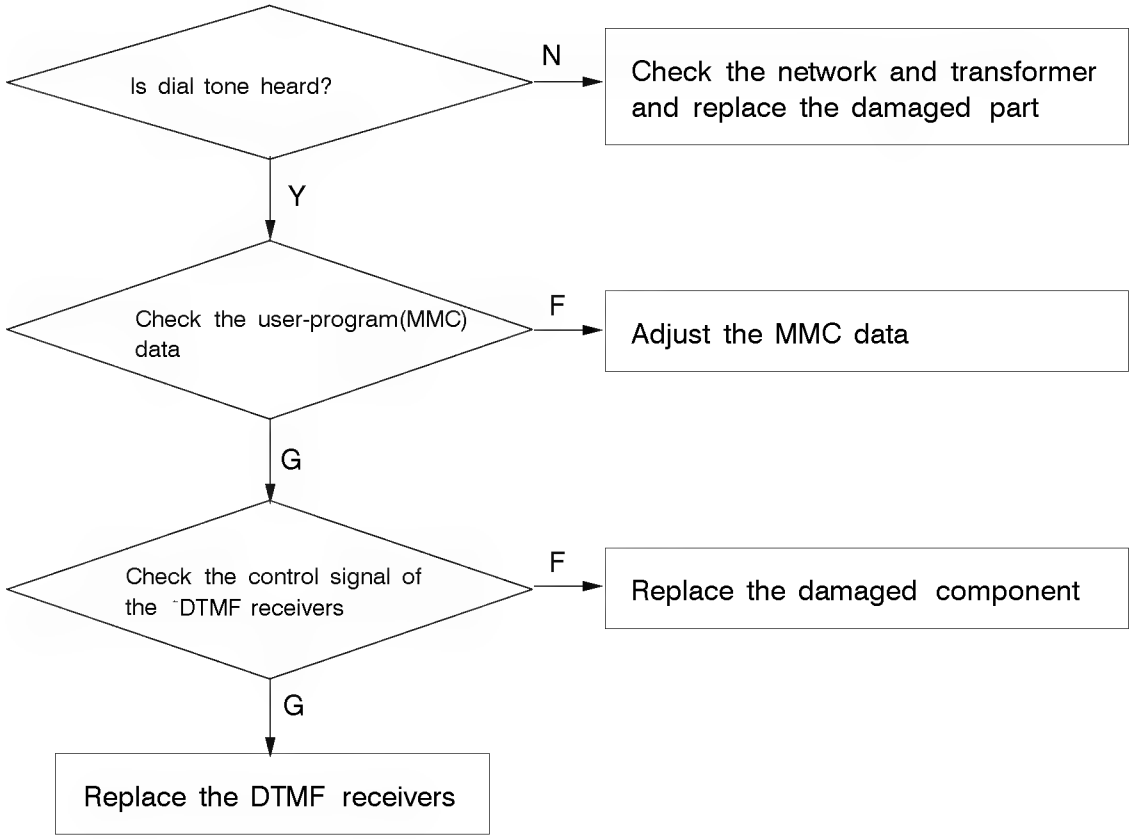
## 3.3.1 SLT DC Feeding Failure


Is Voltage level of two lines, L1 and L2, about 25V?
N
Y
If the SLT is connected to the Hybrid port, Is the related DIP switch set to SLT mode?
Y
N
Adjust the related DIP switch
Check 25VDC fed to the SLT hybrid chip(SLC-03) or Descrete circuit
F
Check 25VDC regulation circuit
G
Replace the related hybrid chip or descrete circuit part

## 3.3.2 SLT Dial Pulse Detection Failure

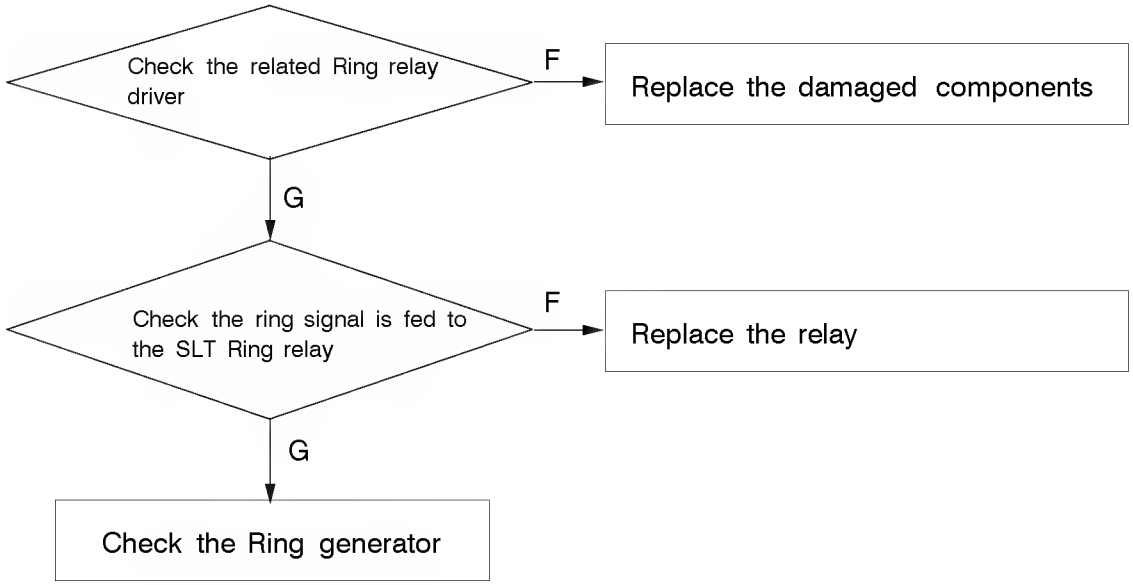

Check the MMC data
F
Adjust the MMC data
G
Check the input terminal of the related read buffer (74HC244)
F
Replace the related hybrid chip( SLC-03) or descrete circuit part
G
Check the chip selection signal of read buffer
F
Check the related decoder and replace it
G
Replace the read buffer(74HC244)

## 3.3.3 SLT DTMF Detection Failure

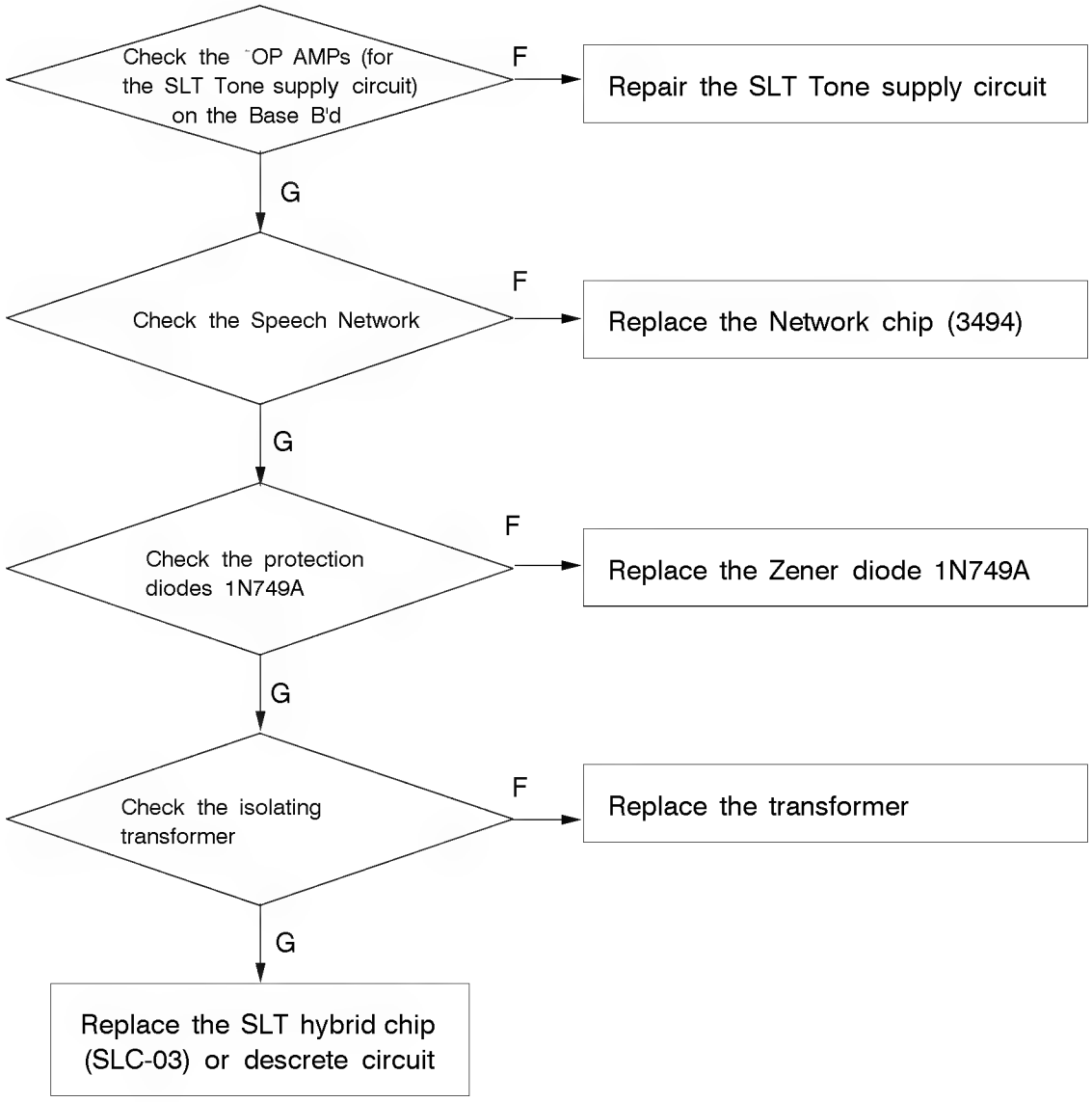



¨DTMF Receiver : MT8870 or KA3170

## 3.3.4 SLT Ring Generation Failure



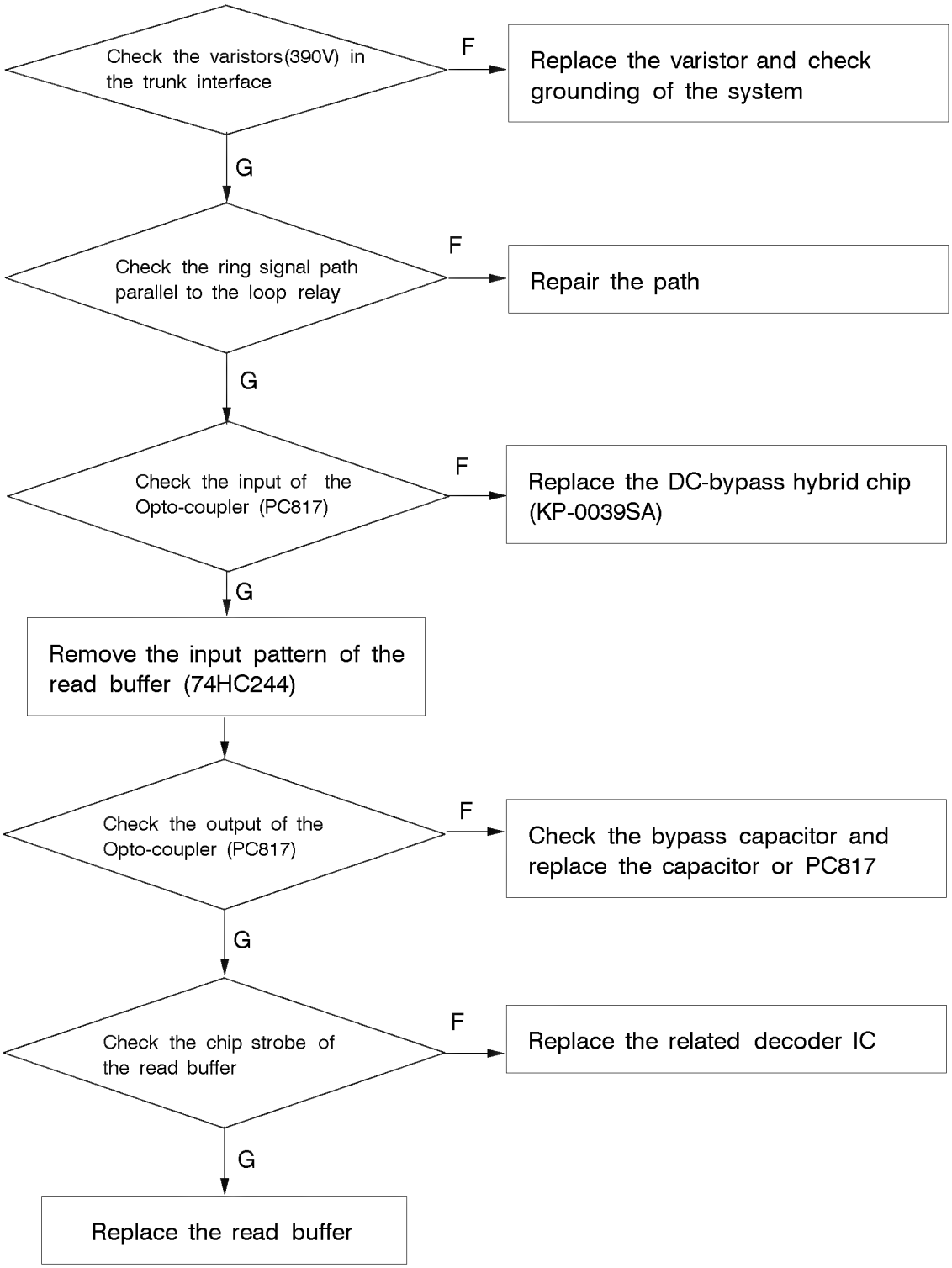
## 3.3.5 SLT Dial Tone Supply Failure



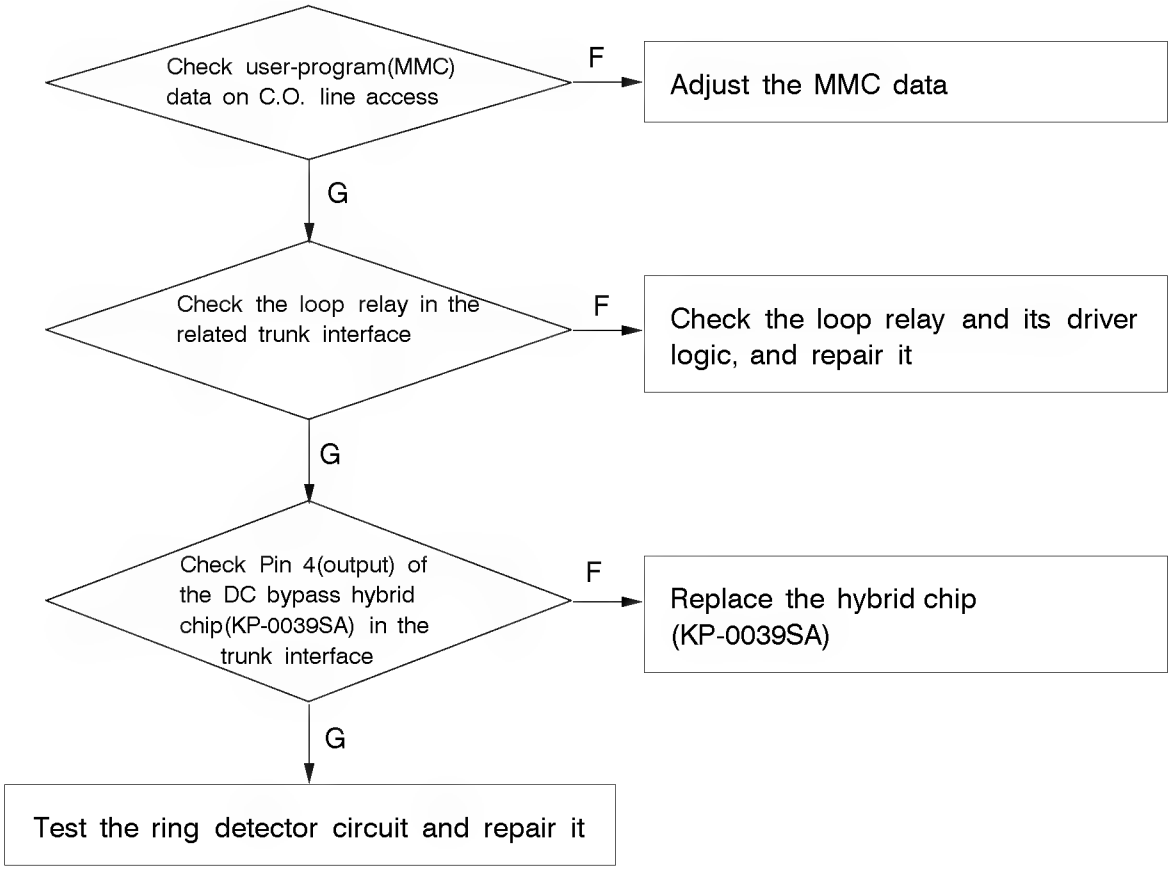

OP AMP(MC 3403) for the SLT Tone supply

# 3.4 TRUNK PART

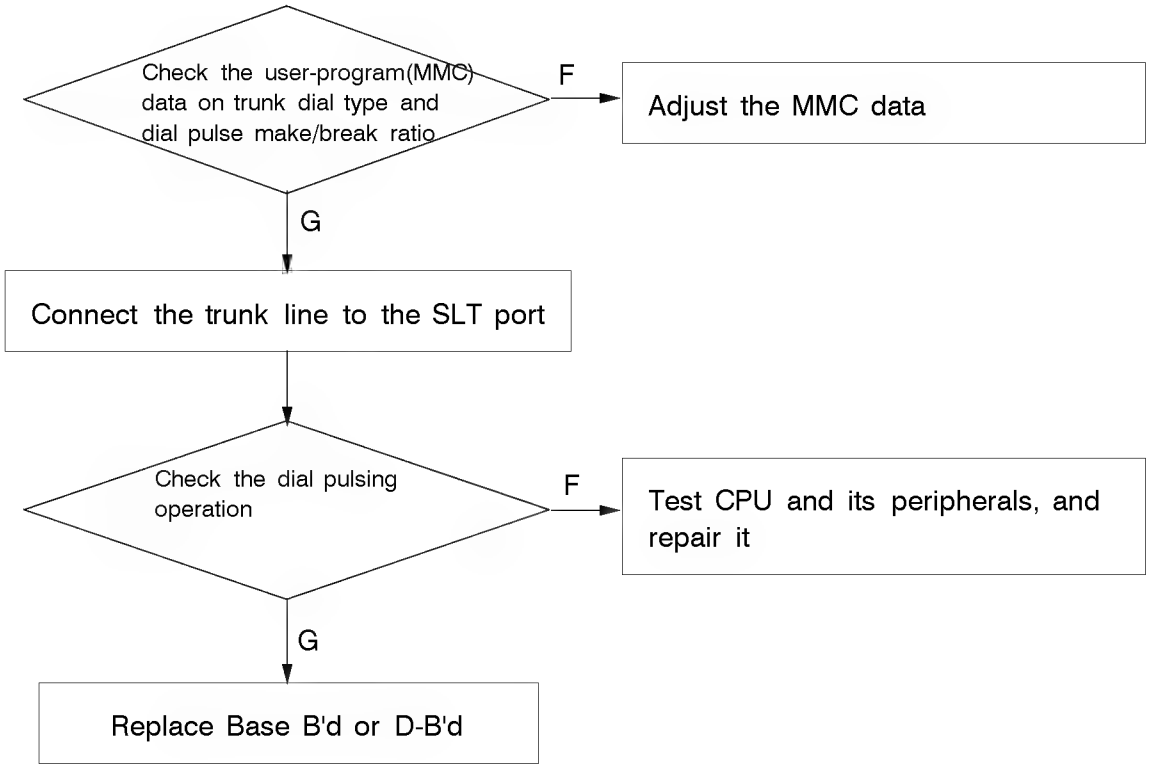
## 3.4.1 Trunk Ring Detection Failure


Check the varistors(390V) in the trunk interface
F
Replace the varistor and check grounding of the system
G
Check the ring signal path parallel to the loop relay
F
Repair the path
G
Check the input of the Opto-coupler (PC817)
F
Replace the DC-bypass hybrid chip (KP-0039SA)
G
Remove the input pattern of the read buffer (74HC244)
Check the output of the Opto-coupler (PC817)
F
Check the bypass capacitor and replace the capacitor or PC817
G
Check the chip strobe of the read buffer
F
Replace the related decoder IC
G
Replace the read buffer

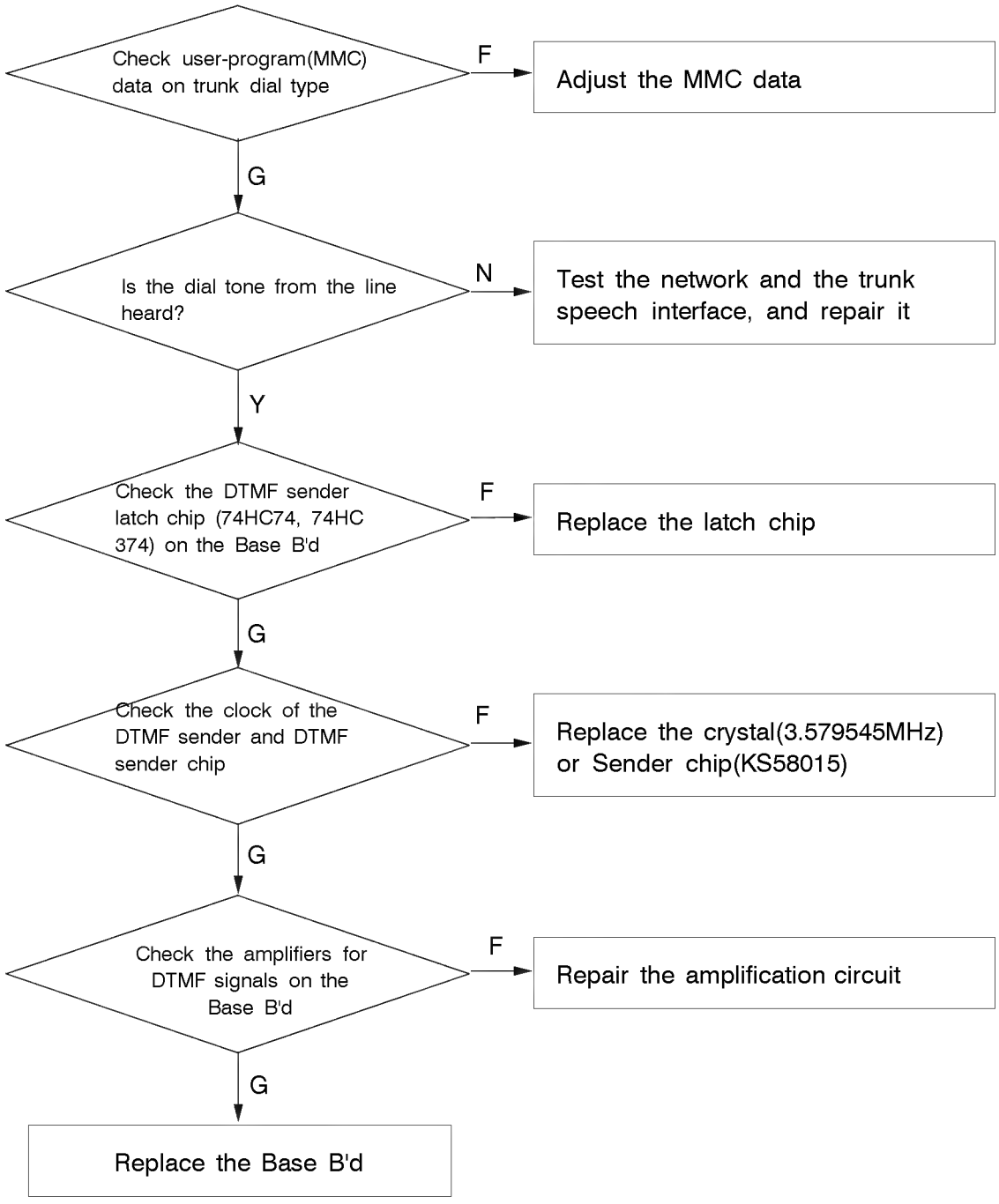
## 3.4.2 Trunk Access Failure


Check user-program(MMC) data on C.O. line access
F
Adjust the MMC data
G
Check the loop relay in the related trunk interface
F
Check the loop relay and its driver logic, and repair it
G
Check Pin 4(output) of the DC bypass hybrid chip(KP-0039SA) in the trunk interface
F
Replace the hybrid chip (KP-0039SA)
G
Test the ring detector circuit and repair it

## 3.4.3 Trunk Dial Pulse Sending Failure

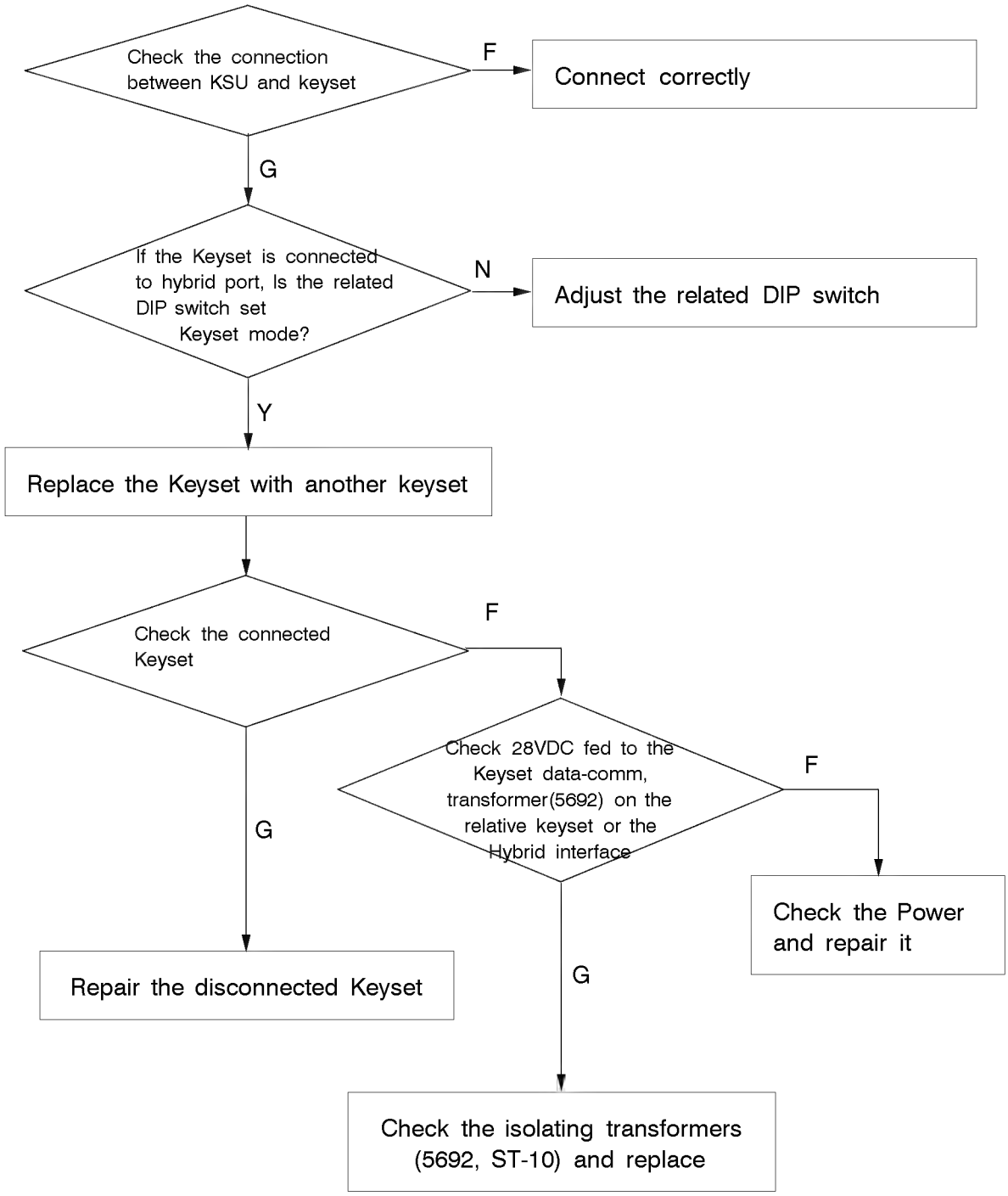

Check the user-program(MMC) data on trunk dial type and dial pulse make/break ratio
F
Adjust the MMC data
G
Connect the trunk line to the SLT port
Check the dial pulsing operation
F
Test CPU and its peripherals, and repair it
G
Replace Base B'd or D-B'd

## 3.4.4 Trunk DTMF Sending Failure

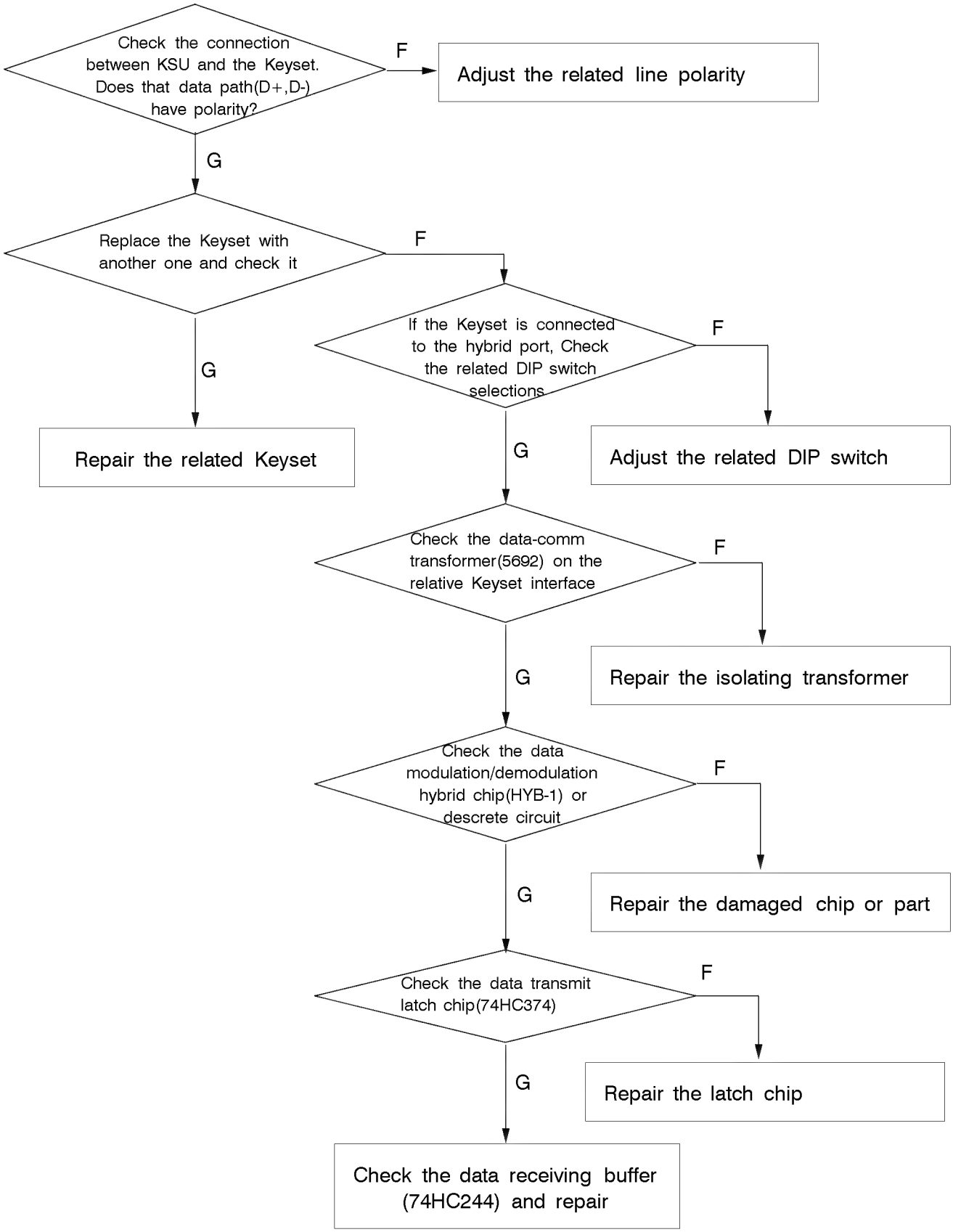

Check user-program(MMC) data on trunk dial type
F
Adjust the MMC data
G
Is the dial tone from the line heard?
N
Test the network and the trunk speech interface, and repair it
Y
Check the DTMF sender latch chip (74HC74, 74HC 374) on the Base B'd
F
Replace the latch chip
G
Check the clock of the DTMF sender and DTMF sender chip
F
Replace the crystal(3.579545MHz) or Sender chip(KS58015)
G
Check the amplifiers for DTMF signals on the Base B'd
F
Repair the amplification circuit
G
Replace the Base B'd

# 3.5 KEYSET PART

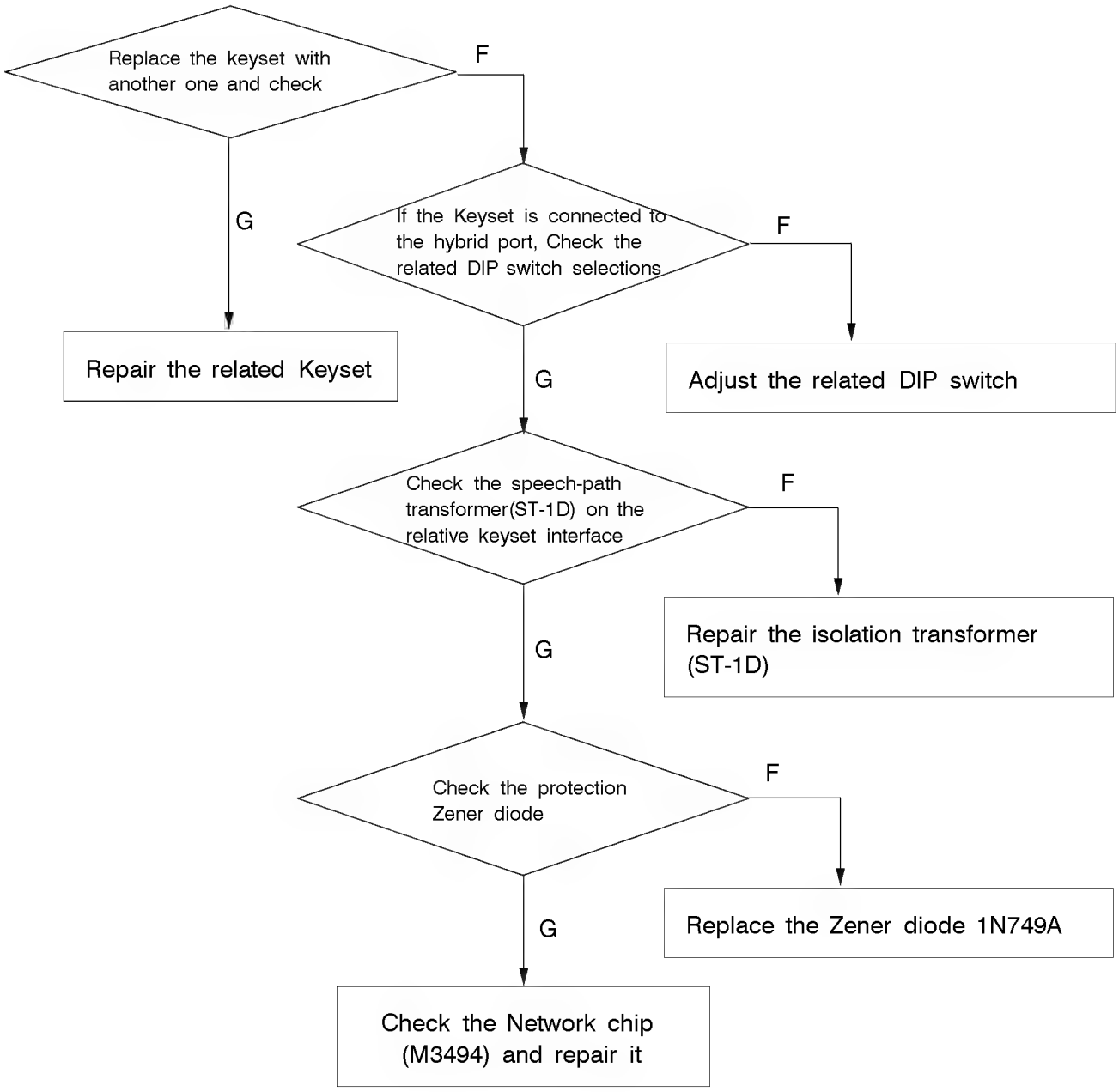
## 3.5.1 Keyset Power Failure


Check the connection between KSU and keyset
F
Connect correctly
G
If the Keyset is connected to hybrid port, Is the related DIP switch set Keyset mode?
N
Adjust the related DIP switch
Y
Replace the Keyset with another keyset
Check the connected Keyset
F
G
Check 28VDC fed to the Keyset data-comm, transformer(5692) on the relative keyset or the Hybrid interface
F
Check the Power and repair it
G
Repair the disconnected Keyset
Check the isolating transformers (5692, ST-10) and replace

## 3.5.2 Keyset Data-comm Failure

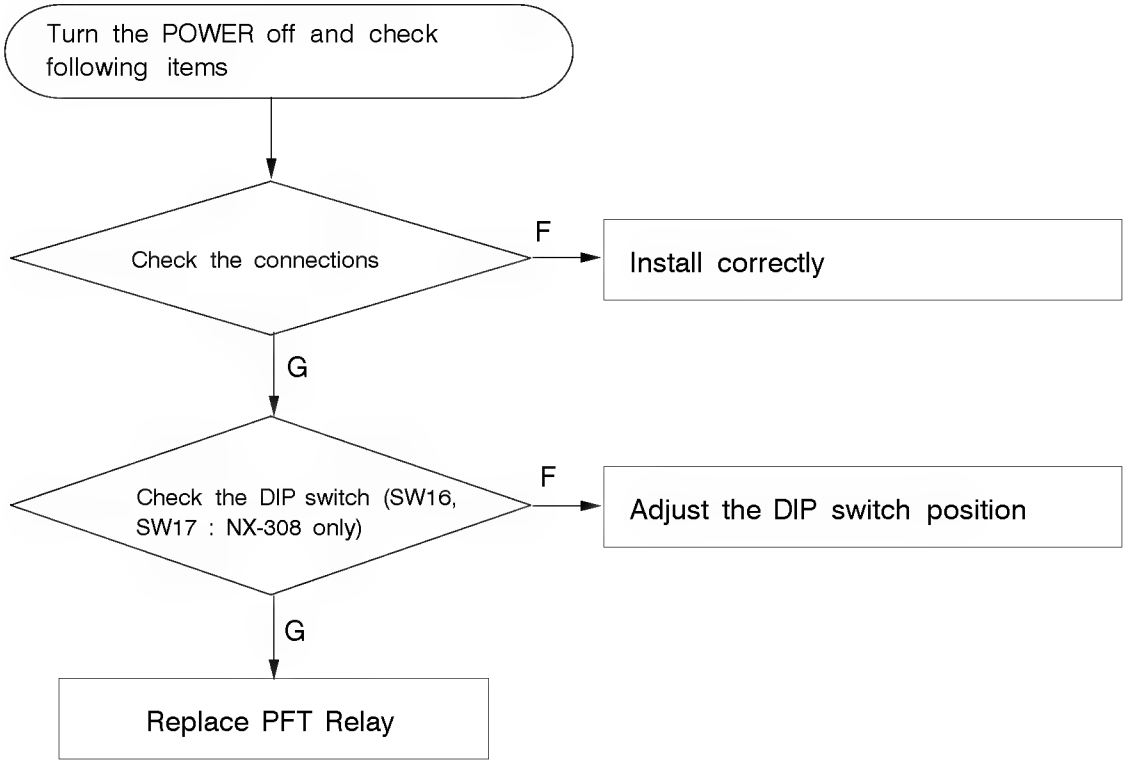

Check the connection between KSU and the Keyset. Does that data path(D+,D-) have polarity?
F
Adjust the related line polarity
G
Replace the Keyset with another one and check it
F
G
If the Keyset is connected to the hybrid port, Check the related DIP switch selections
F
Repair the related Keyset
G
Adjust the related DIP switch
Check the data-comm transformer(5692) on the relative Keyset interface
F
G
Repair the isolating transformer
Check the data modulation/demodulation hybrid chip(HYB-1) or descrete circuit
F
G
Repair the damaged chip or part
Check the data transmit latch chip(74HC374)
F
G
Repair the latch chip
Check the data receiving buffer (74HC244) and repair

## 3.5.3 Keyset Speech Failure

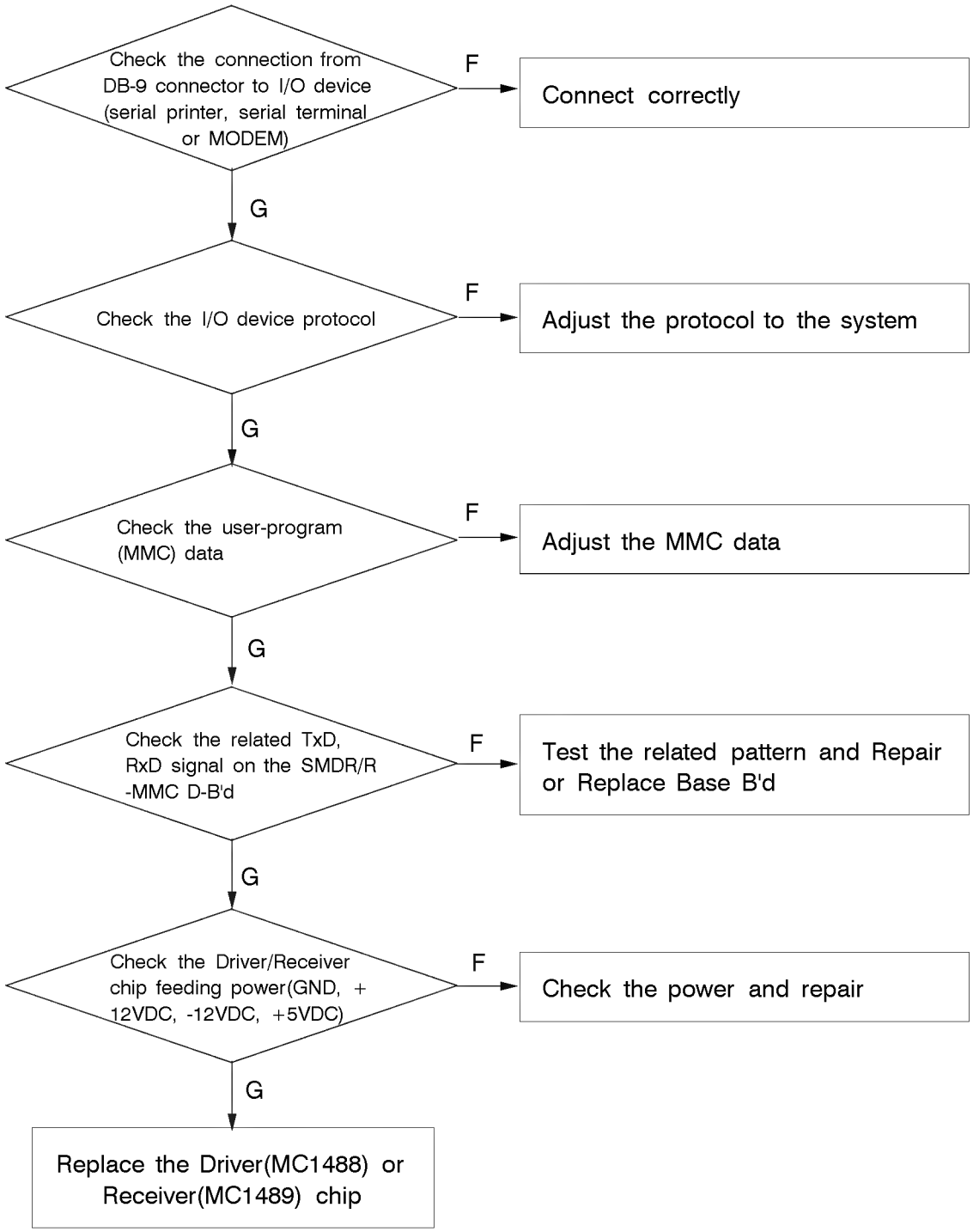

Replace the keyset with another one and check
F
G
If the Keyset is connected to the hybrid port, Check the related DIP switch selections
F
G
Repair the related Keyset
Adjust the related DIP switch
Check the speech-path transformer(ST-1D) on the relative keyset interface
F
G
Repair the isolation transformer (ST-1D)
Check the protection Zener diode
F
G
Replace the Zener diode 1N749A
Check the Network chip (M3494) and repair it

# 3.6 OTHERS

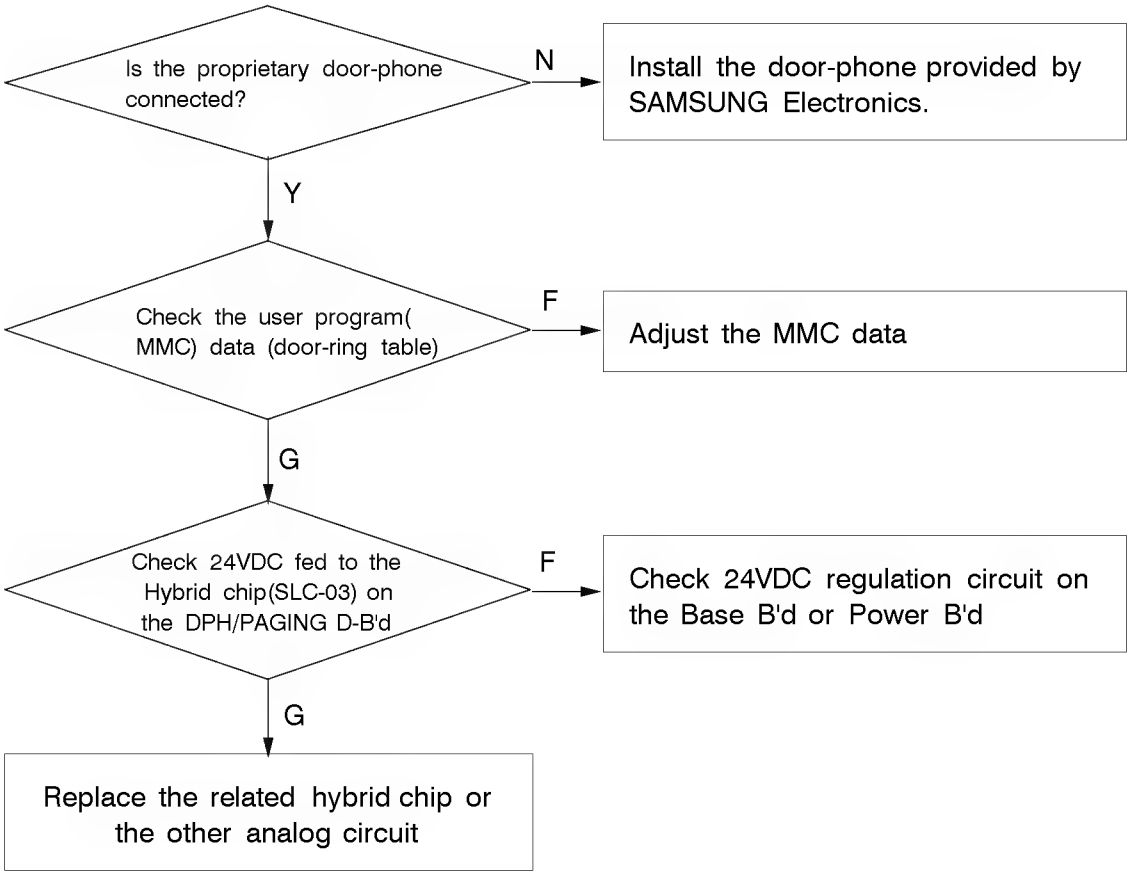
## 3.6.1 Power Fail Transfer(PFT) Failure



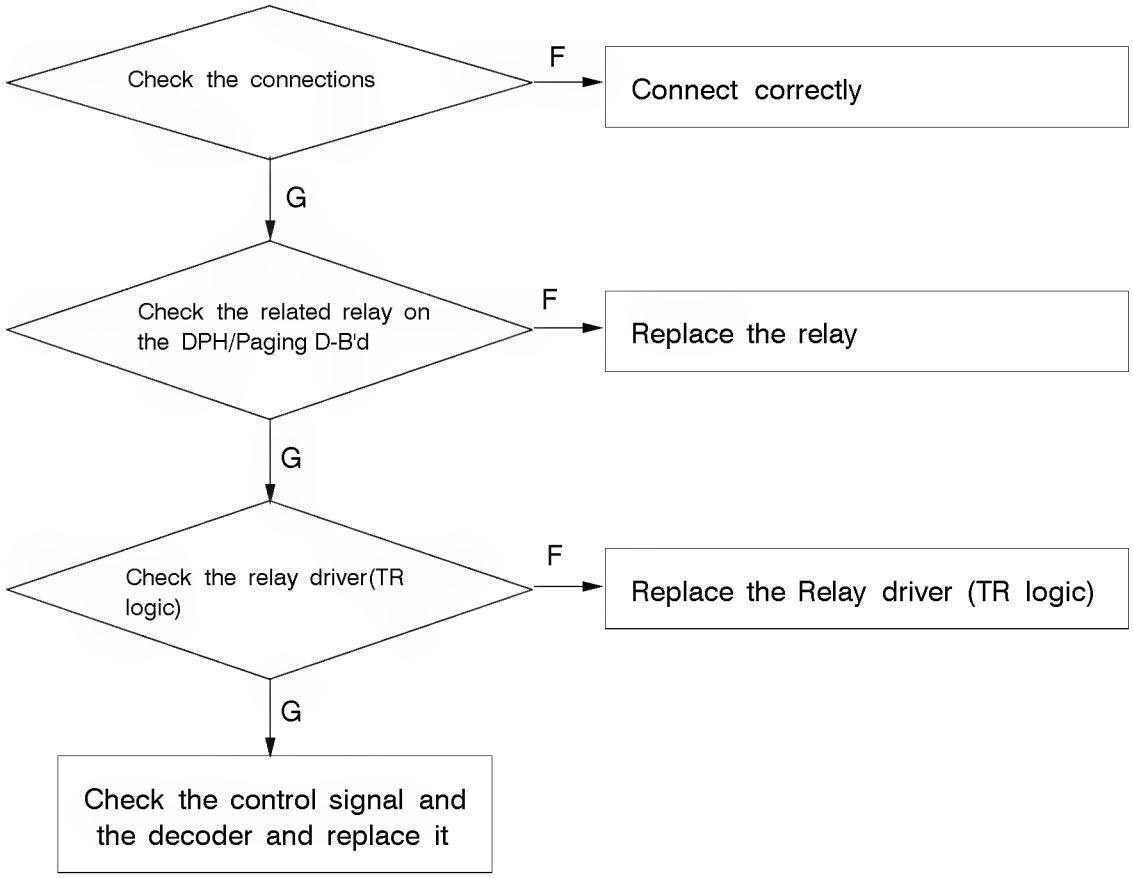
## 3.6.2 SMDR/R-MMC Failure


Check the connection from DB-9 connector to I/O device (serial printer, serial terminal or MODEM)
F
Connect correctly
G
Check the I/O device protocol
F
Adjust the protocol to the system
G
Check the user-program (MMC) data
F
Adjust the MMC data
G
Check the related TxD, RxD signal on the SMDR/R -MMC D-B'd
F
Test the related pattern and Repair or Replace Base B'd
G
Check the Driver/Receiver chip feeding power(GND, + 12VDC, -12VDC, +5VDC)
F
Check the power and repair
G
Replace the Driver(MC1488) or Receiver(MC1489) chip

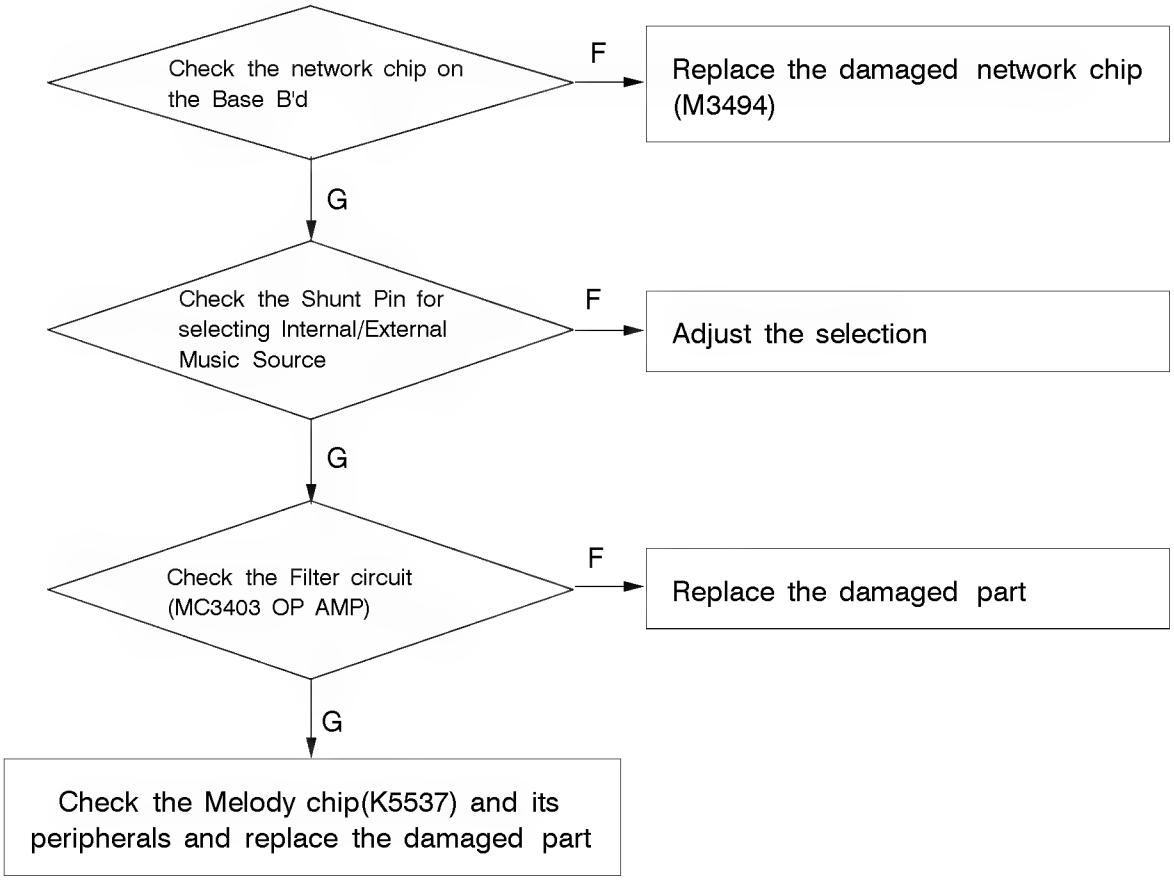
## 3.6.3 Door-phone Failure


Is the proprietary door-phone connected?
N
Install the door-phone provided by SAMSUNG Electronics.
Y
Check the user program( MMC) data (door-ring table)
F
Adjust the MMC data
G
Check 24VDC fed to the Hybrid chip(SLC-03) on the DPH/PAGING D-B'd
F
Check 24VDC regulation circuit on the Base B'd or Power B'd
G
Replace the related hybrid chip or the other analog circuit

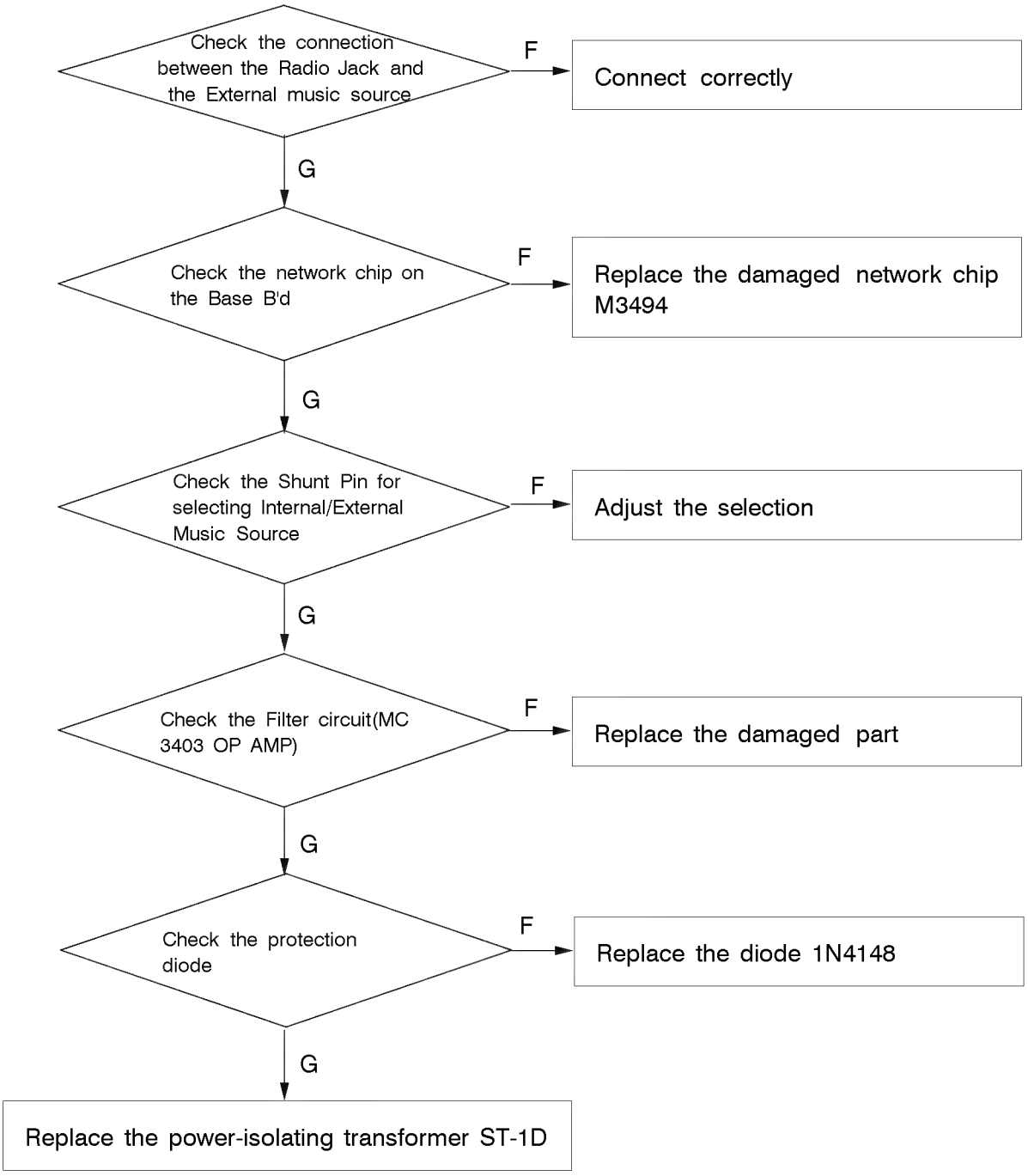
## 3.6.4 Door Lock Failure



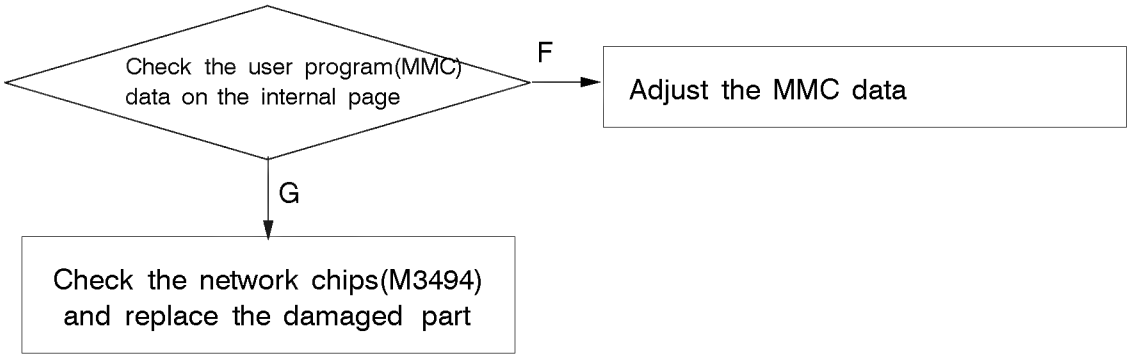
## 3.6.5 Internal Music Source Failure


Check the network chip on the Base B'd
F
Replace the damaged network chip (M3494)
G
Check the Shunt Pin for selecting Internal/External Music Source
F
Adjust the selection
G
Check the Filter circuit (MC3403 OP AMP)
F
Replace the damaged part
G
Check the Melody chip(K5537) and its peripherals and replace the damaged part

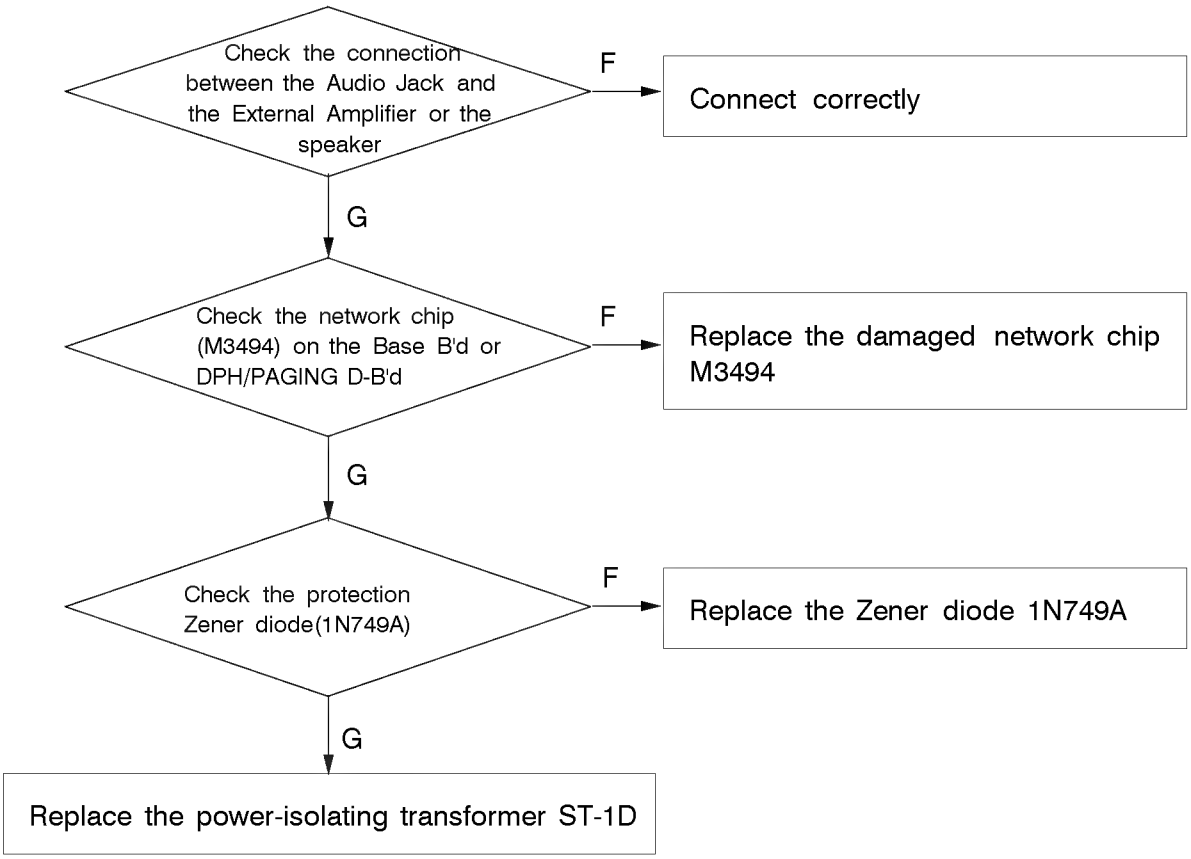
## 3.6.6 External Music Source Failure



## 3.6.7 Internal Page Failure


Check the user program(MMC) data on the internal page
F
Adjust the MMC data
G
Check the network chips(M3494) and replace the damaged part

## 3.6.8 External Page Failure


Check the connection between the Audio Jack and the External Amplifier or the speaker
F
Connect correctly
G
Check the network chip (M3494) on the Base B'd or DPH/PAGING D-B'd
F
Replace the damaged network chip M3494
G
Check the protection Zener diode(1N749A)
F
Replace the Zener diode 1N749A
G
Replace the power-isolating transformer ST-1D

# 6.EXPLODED VIEW & PARTS LIST

6-1 NX-308 SYSTEM

6.1.1 Exploded View

6.1.2 Parts List

6-2 NX-820/1232 SYSTEM

6.2.1 Exploded View

6.2.2 Parts List

6-3 NX-24E KEYSET

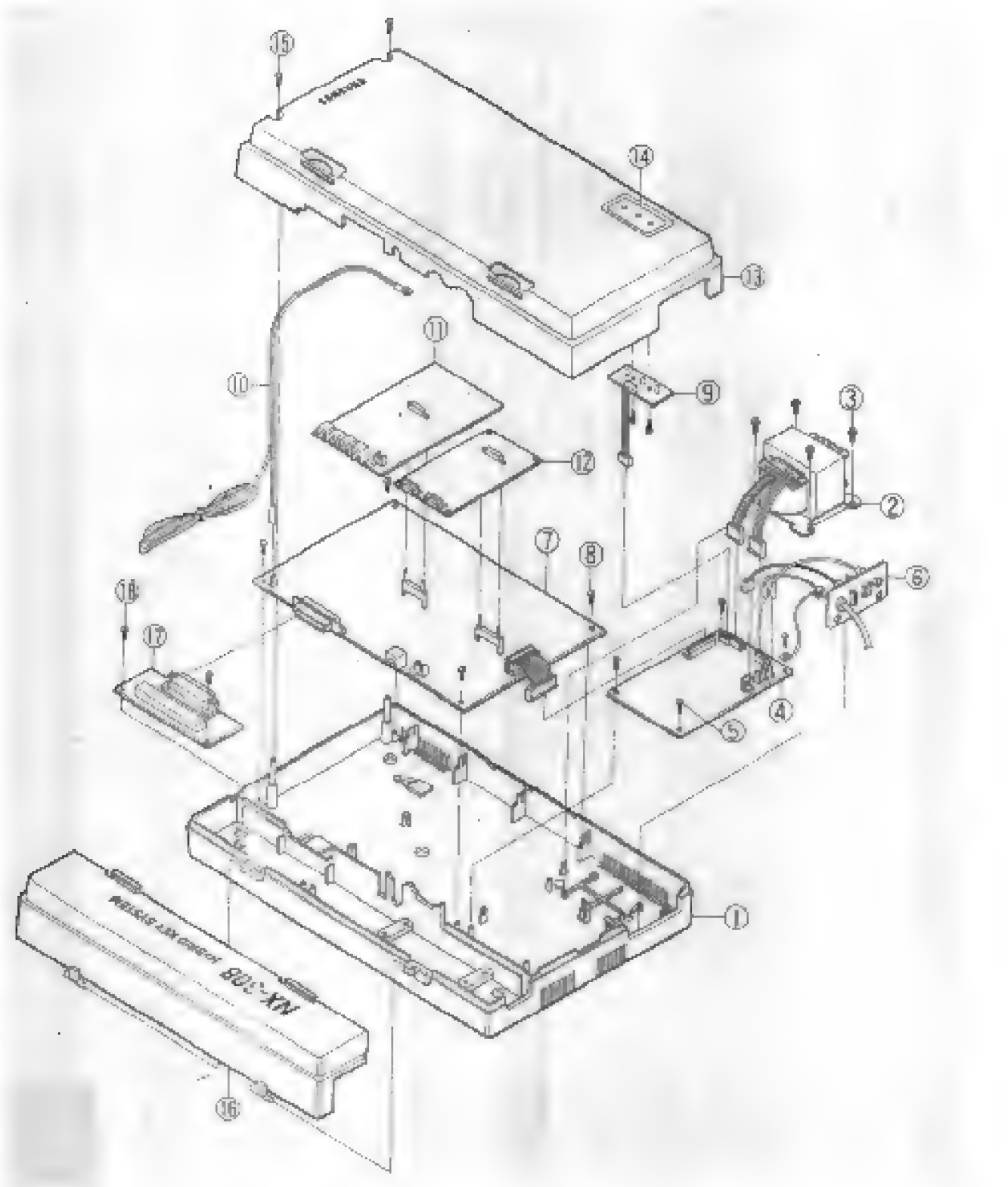
6.3.1 Exploded View

6.3.2 Parts List

# 6. EXPLODED VIEW & PARTS LIST

## 6.1 NX-308 SYSTEM

### 6.1.1 EXPLODED VIEW

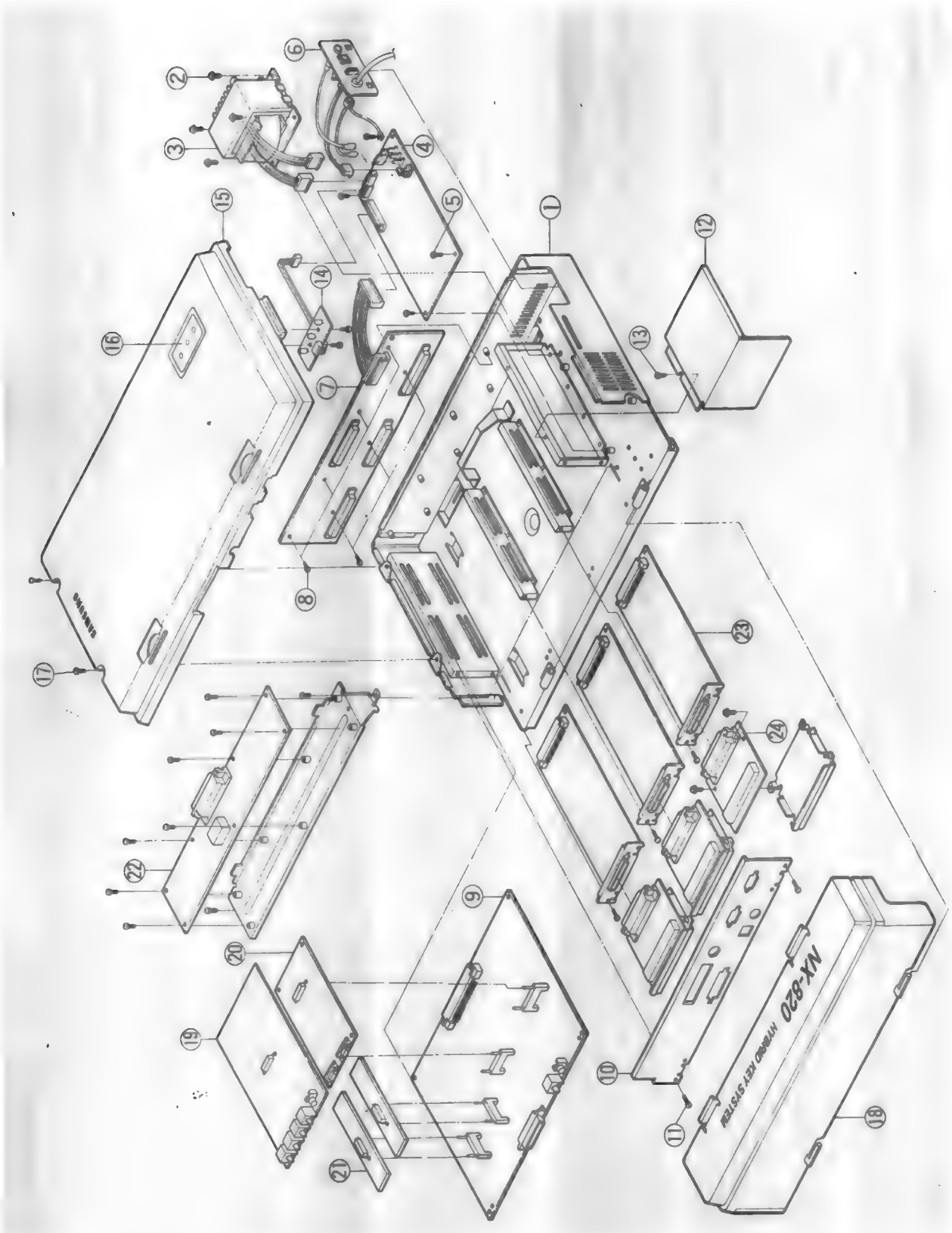


## 6.1.2 PARTS LIST

| NUMBER | SEC CODE | DESCRIPTION |
|---|---|---|
| ① | GA72-40799A | BASE PLATE |
| ② | EC26-30071A | TRANS |
| ③ | 6002-000328 | TAPPING, M4,L8 |
| ④ | GA92-01113A | POWER B'D |
| ⑤,⑧,⑱ | 6002-000147 | TAPPING, M3, L10 |
| ⑥ | GA70-10649A | BRKT-POWER |
| ⑦ | GA92-01111A | BASE B'D |
| ⑨ | GA92-01119A | LED B'D |
| ⑩ | GA39-40002A | CABLE |
| ⑪ | GA92-01115A(00069A) | D/P B'D (W VMS) |
| ⑫ | GA92-01117A | SMDR B'D |
| ⑬ | GA72-40798A | TOP HOUSING |
| ⑭ | GA72-10570A | LED COVER |
| ⑮ | 6006-000130 | MACHING,A,M3,L8 |
| ⑯ | GA72-40800A | SIDE COVER |
| ⑰ | GA92-01151A(01152A) | MDFA-CLIP (-MODULAR) |

# 6.2 NX-820 SYSTEM

## 6.2.1 EXPLODED VIEW

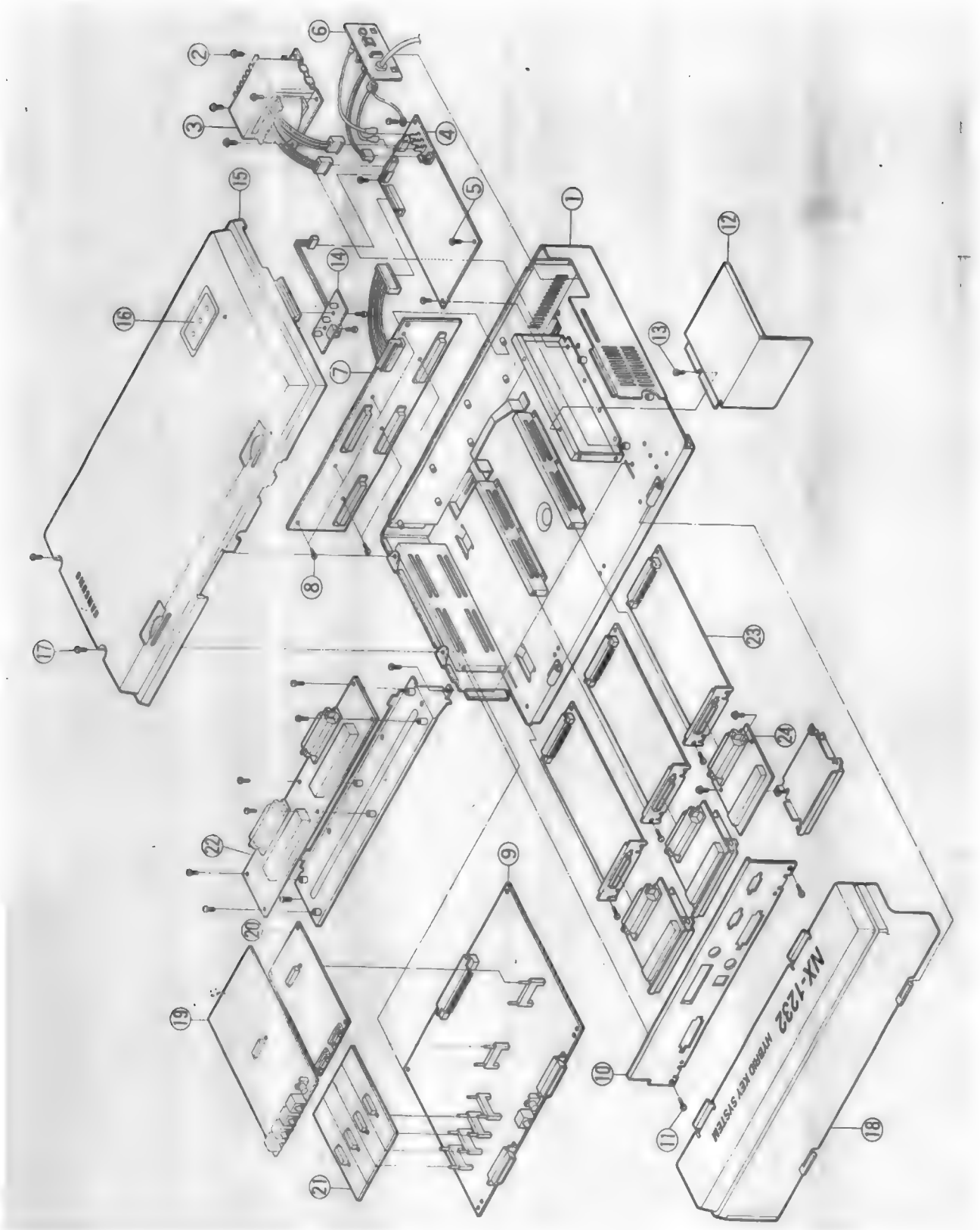


## 6.2.2 PARTS LIST

| NUMBER | SEC CODE | DESCRIPTION |
|---|---|---|
| ① | GA75-10577A | MAIN PLATE ASS'Y |
| ② | 6006-000200 | TAPTITE,M4,L8 |
| ③ | GA26-30071A | TRANS |
| ④ | GA92-01123A | POWER B'D |
| ⑤,⑧,⑪,⑬ | 6006-000130 | MACHINE,M3,L8 |
| ⑥ | GA70-10649A | BRKT-POWER |
| ⑦ | GA92-01125A | CONNECTION B'D |
| ⑨ | GA92-01121A | BASE B'D |
| ⑩ | GA70-10689A | STIFFENER-PBA A |
| ⑫ | GA70-10692A | POWER COVER |
| ⑭ | GA92-01119A | LED B'D |
| ⑮ | GA72-40795A | TOP HOUSING |
| ⑯ | GA72-10570A | LED COVER |
| ⑰ | 6001-000575 | MACHINE,M4,L10 |
| ⑱ | GA72-40796A | SIDE COVER |
| ⑲ | GA92-01115A(00069A) | D/P B'D (W VMS) |
| ⑳ | GA92-01117A | SMDR B'D |
| ㉑ | GA92-01131A(01129A)/01127A | MPD-12KHz(16KHz) / PRS B'D |
| ㉒ | GA92-01155A(01156A) | MDFB-CLIP (-MODULAR) |
| ㉓ | GA92-01135A~01141A | OPTION B'D |
| ㉔ | GA92-01161A(01162A) | MDFD-CLIP (-MODULAR) |

# 6.3 NX-1232 SYSTEM

## 6.3.1 EXPLODED VIEW



## 6.3.2 PARTS LIST

| NUMBER | SEC CODE | DESCRIPTION |
|---|---|---|
| ① | GA75-10577A | MAIN PLATE ASS'Y |
| ② | 6006-000200 | TAPTITE,M4,L8 |
| ③ | GA26-30071A | TRANS |
| ④ | GA92-01123A | POWER B'D |
| ⑤,⑧,⑪,⑬ | 6006-000130 | MACHINE,M3,L8 |
| ⑥ | GA70-10649A | BRKT-POWER |
| ⑦ | GA92-01125A | CONNECTION B'D |
| ⑨ | GA92-01143A | BASE B'D |
| ⑩ | GA70-10690A | STIFFENER-PBA A |
| ⑫ | GA70-10692A | POWER COVER |
| ⑭ | GA92-01119A | LED B'D |
| ⑮ | GA72-40795A | TOP HOUSING |
| ⑯ | GA72-10570A | LED COVER |
| ⑰ | 6001-000575 | MACHINE,M4,L10 |
| ⑱ | GA72-40797A | SIDE COVER |
| ⑲ | GA92-01115A(00069A) | D/P B'D (W VMS) |
| ⑳ | GA92-01117A | SMDR B'D |
| ㉑ | GA92-01131A(01129A)/01127A | MPD-12KHz(16KHz) / PRS B'D |
| ㉒ | GA92-01159A(01160A) | MDFC-CLIP (-MODULAR) |
| ㉓ | GA92-01135A~01147A | OPTION B'D |
| ㉔ | GA92-01161A(01162A) | MDFD-CLIP (-MODULAR) |

# 5.PARTS LIST

5.1 NX-308 BASE B'D .....5 - 1
5.2 NX-820 BASE B'D .....5 - 6
5.3 NX-1232 BASE B'D .....5-11
5.4 NX-308 POWER B'D .....5-16
5.5 NX-820/1232 POWER B'D .....5-19
5.6 NX-4SLI EXP B'D .....5-22
5.7 NX-4KLI EXP B'D .....5-24
5.8 NX-2TRK B'D .....5-25
5.9 NX-4TRK B'D .....5-27
5.10 NX-4OPX B'D .....5-29
5.11 NX-8SLI EXP B'D .....5-31
5.12 NX-8KLI EXP B'D .....5-33
5.13 NX-DOORPHONE/PAGING D-B'D .....5-34
5.14 NX-SMDR / R-MMC B'D .....5-36
5.15 NX-MPD D-B'D
5.15.1. 12KHz .....5-37
5.15.2. 16KHz .....5-37
5.16NX-PRS D-B'D .....5-38

# 5. PARTS LIST

## 5.1 NX-308 BASE B'D

※ FFR : Forcasting Failure Rate per system

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01111A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 6 | D78-79,D81-82,D84-85 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 12 | D2-6,D10-11,D13-17 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 9 | D21-22,D24-28,D32-33 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 12 | D35-39,D43-44,D46-50 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 9 | D54-55,D57-61,D65-66 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 2 | D91-92 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 7 | D68-72,D76-77 | 0.001 |
| 0402-000165 | DIODE-RECTIFIER:1N5819,40 | 2 | D87-88 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 8 | D1,D7-9,D12,D18-20 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 5 | D23,D29-31,D34, | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 7 | D40-42,D45,D51-53 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 7 | D56,D62-64,D73-75 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 5 | D80,D83,D86,D90,D67 | 0.001 |
| 0403-000161 | DIODE-ZENER:1N4751A,30V,5 | 6 | ZD1-2,ZD5-6,ZD9-10 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 26 | ZD3-4,ZD7-8,ZD11-32 | 0.001 |
| 0501-000295 | TR-SMALL SIGNAL:KSA709,PN | 6 | Q2,Q5,Q8,Q11,Q14,Q17 | 0.002 |
| 0501-000295 | TR-SMALL SIGNAL:KSA709,PN | 1 | Q20 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 7 | Q1,Q3-4,Q6-7,Q9-10 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 6 | Q12-13,Q15-16,Q18-19 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 12 | Q21-32 | 0.002 |
| 0801-000412 | IC-CMOS LOGIC:74HC32,OR G | 1 | U14 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 4 | U15-17,U20 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 4 | U7,U10-11,U24 | 0.002 |
| 0801-000708 | IC-CMOS LOGIC:74HC373,D L | 1 | U8 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 3 | U12-13,U23 | 0.001 |
| 0801-000722 | IC-CMOS LOGIC:74HC245,TRA | 1 | U9 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U19 | 0.001 |
| 0801-000913 | IC-CMOS LOGIC:74HC74,D FL | 2 | U18,U21 | 0.001 |
| 0902-000223 | IC-MICROPROCESSOR:64180,8 | 1 | U1 | 0.001 |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 0909-000102 | IC-REAL TIME CLOCK:6242,4 | 1 | U6 | 0.001 |
| 1106-000371 | IC-SRAM:62256,32KX8BIT,DI | 1 | U4 | 0.001 |
| 1201-000250 | IC-OP AMP:3403,DIP,14P,30 | 5 | U25-28,U30 | 0.002 |
| 1202-000138 | IC-VOLTAGE COMP.:1232,DIP | 1 | U22 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U39 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 2 | U2-3 | 0.005 |
| 1205-000468 | IC-DTMF GENERATOR:KS58015 | 1 | U29 | 0.002 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 3 | U31-33 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 8 | P1-8 | 0.002 |
| 1405-000130 | VARISTOR:270V,1200A,9x4.6 | 7 | V8-14 | 0.003 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 7 | V1-7 | 0.003 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 9 | V15-23 | 0.003 |
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 4 | R94-95,R98,R185 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 4 | R124,R127,R129,R132 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 4 | R138,R140,R142,R144 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 4 | R168,R193-194,R197 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 3 | R198,R200-201 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 4 | R72,R76,R80,R159 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 1 | R176 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 4 | R87-88,R89,R123 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 6 | R3,R7-8,R13,R17-18 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R23,R27-28,R33,R37 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R38,R43,R47-48,R53 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R57-58,R63,R67-68 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R73,R77,R81,R83,R86 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 6 | R126,R134-137,R146 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R147,R203 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 3 | R169-170,R208 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R196 | |
| 2001-000315 | R-CARBON:120Kohm,2%,1/4W, | 2 | R181-182 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 3 | R71,R75,R79 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 3 | R209,R84-85 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 3 | R100,R102,R192 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 6 | R1-2,R11-12,R21-22 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 6 | R31-32,R41-42,R51-52 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 5 | R61-62,R204-206 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 4 | R74,R78,R82,R93 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 3 | R96-97,R186 | |
| 2001-000467 | R-CARBON:2.7Kohm,2%,1/4W, | 2 | R179-180 | |
| 2001-000532 | R-CARBON:240ohm,2%,1/4W,A | 1 | R184 | |
| 2001-000543 | R-CARBON:270Kohm,2%,1/4W, | 2 | R172-173 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 5 | R4,R6,R14,R16,R24 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 5 | R26,R34,R36,R44,R46 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 5 | R54,R56,R64,R66,R167 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 1 | R178 | |
| 2001-000573 | R-CARBON:2Kohm,2%,1/4W,AA | 5 | R121-122,R150-152 | |
| 2001-000573 | R-CARBON:2Kohm,2%,1/4W,AA | 3 | R154,R174-R175 | |
| 2001-000585 | R-CARBON:3.3Kohm,2%,1/4W, | 8 | R109-116 | |
| 2001-000620 | R-CARBON:300Kohm,2%,1/4W, | 1 | R92 | |
| 2001-000648 | R-CARBON:330ohm,2%,1/4W,A | 1 | R202 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 2 | R161,R164 | |
| 2001-000675 | R-CARBON:36Kohm,2%,1/4W,A | 2 | R160,R166 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 9 | R103-108,R118-120 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 2 | R207,R236 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 3 | R195,R199,R212 | |
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 2 | R165,R177 | |
| 2001-000859 | R-CARBON:56Kohm,2%,1/4W,A | 5 | R5,R15,R25,R35,R45 | |
| 2001-000859 | R-CARBON:56Kohm,2%,1/4W,A | 3 | R55,R65,R171 | |
| 2001-000905 | R-CARBON:62Kohm,2%,1/4W,A | 1 | R188 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R117 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 2 | R162-163 | |
| 2001-000973 | R-CARBON:8.2Kohm,2%,1/4W, | 3 | R148-149,R153 | |
| 2001-000973 | R-CARBON:8.2Kohm,2%,1/4W, | 5 | R155-158,R233 | |
| 2001-000996 | R-CARBON:82Kohm,2%,1/4W,A | 4 | R125,R128,R130-131 | |
| 2001-000996 | R-CARBON:82Kohm,2%,1/4W,A | 4 | R139,R141,R143,R145 | |
| 2001-001011 | R-CARBON:9.1Kohm,2%,1/4W, | 1 | R190 | |
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 4 | R99,R101,R187,R191 | |
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 1 | R189 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 6 | R9-10,R19-20,R29-30 | |
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 6 | R39-40,R49-50,R59-60 | |
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 2 | R69-70 | |
| 2011-000284 | R-NETWORK:1Kohm,2%,1/8W,A | 1 | RA4 | |
| 2201-000357 | C-CERAMIC,DISC:20pF,5%,50 | 1 | C88 | |
| 2201-000357 | C-CERAMIC,DISC:20pF,5%,50 | 4 | C67,C112-113,C168 | |
| 2201-000376 | C-CERAMIC,DISC:220pF,5%,5 | 1 | C90 | |
| 2201-000464 | C-CERAMIC,DISC:30pF,5%,50 | 2 | C97,C100 | |
| 2201-000558 | C-CERAMIC,DISC:470pF,10%, | 2 | C83,C92 | |
| 2201-000642 | C-CERAMIC,DISC:680pF,10%, | 4 | C75,C77,C85,C99 | |
| 2202-000603 | C-CERAMIC,MLC-RADIAL:1uF, | 1 | C114 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C80-82,C84 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 25 | C14,C45-66,C68-69 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C71-74 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 7 | C87,C91,C93-96,C98 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 10 | C101-102,C104-111 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 2 | C135,C197 | |
| 2202-000686 | C-CERAMIC,MLC-RADIAL:1nF, | 1 | C89 | |
| 2301-000175 | C-FILM,PEF:15nF,5%,50V,7. | 2 | C123-124 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 3 | C119-121 | |
| 2301-000335 | C-FILM,PEF:10nF,5%,50V,6. | 5 | C115-118,C122, | |
| 2305-000128 | C-FILM,MPEF:100nF,10%,250 | 1 | C126 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 8 | C127-134 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 3 | C29,C34,C39 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 7 | C2,C6,C10,C18,C22 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 2 | C26,C145 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 5 | C20,C23-24,C27-28 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C33,C38 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 4 | C43,C70,C142,C144 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 6 | C3,C4,C7,C9,C11-12 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C15,C19 | |
| 2401-000031 | C-AL:47uF,20%,16V,GP,6.3* | 1 | C141 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 4 | C32,C37,C42,C136 | |
| 2401-000050 | C-AL:10uF,20%,16V,GP,5x11 | 2 | C137,C143 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 3 | C30,C35,C40 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C140 | |
| 2401-001757 | C-AL:22uF,20%,16V,GP,5x7m | 6 | C1,C5,C8,C13,C17,C21 | |
| 2401-001757 | C-AL:22uF,20%,16V,GP,5x7m | 1 | C25 | |
| 2503-000140 | C-NETWORK:220pF,5%,100V | 4 | CA1-3,CA5 | |
| 2801-000133 | CRYSTAL-UNIT:12.288MHz,50 | 1 | X2 | 0.002 |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 2 | X3-4 | 0.002 |
| 2801-001365 | CRYSTAL-UNIT:32.768KHz,30 | 1 | X1 | 0.002 |
| 3301-000345 | CORE-FERRITE BEAD:ZZ,3.5x | 1 | L1 | |
| 3407-000121 | SWITCH-DIP:24V,300mA,SLID | 8 | SW1-8 | |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 3 | REL11-13 | 0.001 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 10 | REL1-10 | 0.001 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN1 | |
| 3704-000255 | SOCKET-IC:32P,DIP,SN,2.54 | 1 | U5 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 2 | U2-3 | |
| 3710-000107 | CONNECTOR-SHUNT:2P,1R,2.5 | 2 | CN5-6 | |
| 3711-000118 | CONNECTOR-HEADER:1WALL,10 | 1 | CN2 | |
| 3711-001367 | CONNECTOR-HEADER:2WALL,20 | 1 | CN9 | |
| 3711-001479 | CONNECTOR-HEADER:NOWALL,3 | 2 | CN5-6 | |
| 3711-003103 | CONNECTOR-HEADER:2WALL,40 | 1 | CN12 | |
| 3722-000248 | JACK-MODULAR:6P/4C,-,AU30 | 1 | CN3 | |
| 4302-000126 | BATTERY-NICD(2ND):3.6V;1. | 1 | BAT1 | 0.002 |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 2 | SRW1-2 | |
| 881 703810TA | IC-LIN,3810,MELODY IC:TO- | 1 | U38 | |
| 887 190016SH | ,:-,-,-,-,-,-, | 2 | RA1-2 | |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 3 | U34-36 | 0.003 |
| 935 720053AA | CON-JACK PHONE:-,11.89X10 | 1 | CN4 | |
| 935 810010AA | CON-TERMINAL,PLUG,TAB:TAB | 1 | CN7 | |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 8 | T12-19 | 0.001 |
| GA13-10068A | IC-HYB:STA-1224,DANA/KP-0 | 3 | HIC1-3 | 0.001 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 12 | T1-5,T7-11,T20,T19 | 0.001 |

# 5.2 NX-820 BASE B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01121A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 66 | D5-12,D51-108 | 0.001 |
| 0402-000165 | DIODE-RECTIFIER:1N5819,40 | 2 | D48-49 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 37 | D1-4,D15-47 | 0.001 |
| 0403-000161 | DIODE-ZENER:1N4751A,30V,5 | 8 | ZD1-8 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 36 | ZD9-44 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD45 | 0.001 |
| 0501-000295 | TR-SMALL SIGNAL:KSA709,PN | 8 | Q19-26 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 29 | Q3-18,Q27-39 | 0.002 |
| 0801-000412 | IC-CMOS LOGIC:74HC32,OR G | 1 | U29 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 3 | U9-11 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 4 | U7-8,U30,U46 | 0.002 |
| 0801-000708 | IC-CMOS LOGIC:74HC373,D L | 1 | U35 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 4 | U5-6,U12,U38 | 0.001 |
| 0801-000722 | IC-CMOS LOGIC:74HC245,TRA | 2 | U13,U31 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 2 | U15,U40 | 0.001 |
| 0801-000913 | IC-CMOS LOGIC:74HC74,D FL | 2 | U16,U25 | 0.001 |
| 0801-000918 | IC-CMOS LOGIC:74HCT139,LI | 2 | U14,U54 | 0.001 |
| 0902-000223 | IC-MICROPROCESSOR:64180,8 | 1 | U27 | 0.001 |
| 0909-000102 | IC-REAL TIME CLOCK:6242,4 | 1 | U21 | 0.001 |
| 1106-000137 | IC-SRAM:681000,128KX8BIT, | 1 | U22 | 0.001 |
| 1201-000250 | IC-OP AMP:3403,DIP,14P,30 | 4 | U32-33,U36-37 | 0.002 |
| 1202-000138 | IC-VOLTAGE COMP.:1232,DIP | 1 | U26 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U39 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 4 | U17-20 | 0.005 |
| 1205-000468 | IC-DTMF GENERATOR:KS58015 | 1 | U34 | 0.002 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 3 | U42-44 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 5 | P1-4,P9 | 0.003 |
| 1405-000130 | VARISTOR:270V,1200A,9x4.6 | 8 | V15-22 | 0.003 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 8 | V25-32 | 0.003 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 11 | V1-11 | 0.003 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 1 | V12 | 0.003 |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 4 | R146,R151,R165,R169 | |
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 3 | R172,R177,R180 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 3 | R137,R183-184 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 4 | R186-187,R191-192 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 6 | R9-12,R152,R159 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 10 | R5-8,R49-51,R53-55 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 9 | R57-59,R61-63,R65-67 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 6 | R69-71,R78,R79,R136 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R73-75,R77,R120 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 7 | R99-104,R116 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R188 | |
| 2001-000315 | R-CARBON:120Kohm,2%,1/4W, | 2 | R155-156 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 4 | R1-4 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 3 | R97,R122-123 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 4 | R144-145,R166-167 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 2 | R174-175 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 11 | R41-48,R52,R56,R60 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 5 | R64,R68,R72,R76,R80 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 3 | R117,R119,R121 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 6 | R13-16,R147,R150 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 4 | R160,R170,R173,R178 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 1 | R181 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 16 | R204-211,R213-220 | |
| 2001-000467 | R-CARBON:2.7Kohm,2%,1/4W, | 2 | R153,R157 | |
| 2001-000532 | R-CARBON:240ohm,2%,1/4W,A | 1 | R182 | |
| 2001-000543 | R-CARBON:270Kohm,2%,1/4W, | 2 | R131,R135 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 18 | R25-40,R141,R154 | |
| 2001-000620 | R-CARBON:300Kohm,2%,1/4W, | 1 | R113 | |
| 2001-000648 | R-CARBON:330ohm,2%,1/4W,A | 1 | R118 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 2 | R133,R143 | |
| 2001-000675 | R-CARBON:36Kohm,2%,1/4W,A | 2 | R138,R142 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 9 | R98,R105-112 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R126-129 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 3 | R185,R189,R190 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 2 | R139,R158 | |
| 2001-000859 | R-CARBON:56Kohm,2%,1/4W,A | 9 | R17-24,R134 | |
| 2001-000905 | R-CARBON:62Kohm,2%,1/4W,A | 1 | R161 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R130 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 2 | R132,R140 | |
| 2001-001011 | R-CARBON:9.1Kohm,2%,1/4W, | 1 | R164 | |
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 4 | R148-149,R162,R168 | |
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 4 | R171,R176,R179,R163 | |
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 16 | R81-96 | |
| 2011-000284 | R-NETWORK:1Kohm,2%,1/8W,A | 2 | RA4-5 | |
| 2201-000357 | C-CERAMIC,DISC:20pF,5%,50 | 5 | C95-96,C100-101,C132 | |
| 2201-000376 | C-CERAMIC,DISC:220pF,5%,5 | 1 | C137 | |
| 2201-000464 | C-CERAMIC,DISC:30pF,5%,50 | 2 | C170,C172 | |
| 2201-000558 | C-CERAMIC,DISC:470pF,10%, | 2 | C131,C135 | |
| 2201-000642 | C-CERAMIC,DISC:680pF,10%, | 4 | C141,C144,C159,C163 | |
| 2201-000642 | C-CERAMIC,DISC:680pF,10%, | 3 | C121,C127,C138 | |
| 2202-000603 | C-CERAMIC,MLC-RADIAL:1uF, | 1 | C81 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 17 | C102-103,C105-119 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C152,C160,C162,C168 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 16 | C82-94,C97-99 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C122-123,C129-130 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 3 | C133-134,C142 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 8 | C145-148,C154-157 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 2 | C165-166 | |
| 2202-000675 | C-CERAMIC,MLC-RADIAL:10nF | 1 | C150 | |
| 2202-000686 | C-CERAMIC,MLC-RADIAL:1nF, | 1 | C149 | |
| 2301-000175 | C-FILM,PEF:15nF,5%,50V,7. | 2 | C151,C153 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 3 | C161,C169,C171 | |
| 2301-000335 | C-FILM,PEF:10nF,5%,50V,6. | 1 | C139 | |
| 2301-000335 | C-FILM,PEF:10nF,5%,50V,6. | 3 | C120,C124-5 | |
| 2305-000128 | C-FILM,MPEF:100nF,10%,250 | 1 | C174 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 6 | C21-24,C29-30 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 4 | C1-4 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 8 | C41-48 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 22 | C5-8,C53-68,C76-77 | |
| 2401-000031 | C-AL:47uF,20%,16V,GP,6.3* | 1 | C74 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 6 | C13-16,C72-73 | |
| 2401-000050 | C-AL:10uF,20%,16V,GP,5x11 | 2 | C70,C75 | |
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 4 | C9-12 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 3 | C69,C71,C80 | |
| 2401-001757 | C-AL:22uF,20%,16V,GP,5x7m | 8 | C33-40 | |
| 2503-000140 | C-NETWORK:220pF,5%,100V | 4 | CA2-5 | |
| 2801-000133 | CRYSTAL-UNIT:12.288MHz,50 | 1 | X1 | 0.002 |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 2 | X3-4 | 0.002 |
| 2801-001365 | CRYSTAL-UNIT:32.768KHz,30 | 1 | X2 | 0.002 |
| 3301-000345 | CORE-FERRITE BEAD:ZZ,3.5x | 1 | L2 | |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 4 | REL1-4 | 0.002 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 11 | REL7-17 | 0.002 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN9 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN10 | |
| 3704-000189 | SOCKET-IC:20P,DIP,SN,2.54 | 1 | U28 | |
| 3704-000255 | SOCKET-IC:32P,DIP,SN,2.54 | 1 | U23 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 4 | U17-20 | |
| 3710-000107 | CONNECTOR-SHUNT:2P,1R,2.5 | 2 | CN3,CN11 | |
| 3711-001367 | CONNECTOR-HEADER:2WALL,20 | 3 | CN4,CN7-8 | |
| 3711-001479 | CONNECTOR-HEADER:NOWALL,3 | 2 | CN3,CN11 | |
| 3711-003103 | CONNECTOR-HEADER:2WALL,40 | 1 | CN6 | |
| 3722-000248 | JACK-MODULAR:6P/4C,-,AU30 | 1 | CN2 | |
| 4302-000126 | BATTERY-NICD(2ND):3.6V;1. | 1 | BAT1 | 0.002 |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 881 703810TA | IC-LIN,3810,MELODY IC:TO- | 1 | U41 | |
| 887 190016SH | ,:-,-,-,-,-,-, | 2 | RA2-3 | |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 4 | U1-4 | |
| 935 720053AA | CON-JACK PHONE:-,11.89X10 | 1 | CN1 | |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 4 | T17-20 | 0.001 |
| GA13-10068A | IC-HYB:STA-1224,DANA/KP-0 | 4 | HIC1-HIC4 | 0.002 |
| GA13-10070A | IC-HYB:EURO 816H,DANA/HYB | 1 | HIC10 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC9 | 0.002 |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 17 | T1-16,T25 | 0.001 |
| JF27-20050A | COIL-AF:KP32,300UH,0.35OH | 1 | L1 | |

# 5.3 NX-1232 BASE B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01143A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 18 | D1-2,D28-43 | 0.001 |
| 0402-000165 | DIODE-RECTIFIER:1N5819,40 | 2 | D45-46 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 25 | D3-27 | 0.001 |
| 0403-000161 | DIODE-ZENER:1N4751A,30V,5 | 16 | ZD1-16 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 52 | ZD17-68 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD70 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 25 | Q1-25 | 0.002 |
| 0801-000412 | IC-CMOS LOGIC:74HC32,OR G | 1 | U31 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 3 | U20-22 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 5 | U10-11,U16,U23,U25 | 0.002 |
| 0801-000708 | IC-CMOS LOGIC:74HC373,D L | 1 | U44 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 5 | U9,U12,U15,U24,U50 | 0.001 |
| 0801-000722 | IC-CMOS LOGIC:74HC245,TRA | 2 | U37,U42 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 2 | U32,U38 | 0.001 |
| 0801-000913 | IC-CMOS LOGIC:74HC74,D FL | 2 | U19,U39 | 0.001 |
| 0801-000918 | IC-CMOS LOGIC:74HCT139,LI | 2 | U17,U43 | 0.002 |
| 0902-000223 | IC-MICROPROCESSOR:64180,8 | 1 | U36 | 0.001 |
| 0909-000102 | IC-REAL TIME CLOCK:6242,4 | 1 | U46 | 0.001 |
| 1106-000137 | IC-SRAM:681000,128KX8BIT, | 1 | U34 | 0.001 |
| 1201-000250 | IC-OP AMP:3403,DIP,14P,30 | 4 | U13,U18,U41,U47 | 0.002 |
| 1202-000138 | IC-VOLTAGE COMP.:1232,DIP | 1 | U49 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U51 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 5 | U26-30 | 0.005 |
| 1205-000468 | IC-DTMF GENERATOR:KS58015 | 1 | U45 | 0.002 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 4 | U52-55 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 9 | P1-9 | 0.002 |
| 1405-000130 | VARISTOR:270V,1200A,9x4.6 | 16 | V1-3,V12-24 | 0.002 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 16 | V41-56 | 0.002 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 24 | V4-11,V25-40 | 0.002 |
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 5 | R39,R41,R55,R59,R68 | |
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 3 | R89-90,R106 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 4 | R75,R108-109,R112 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 5 | R118-120,R123,R126 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 8 | R17,R24-25,R27-31 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 2 | R97-98 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 13 | R2,R11-16,R18-22,R26 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 1 | R73 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 3 | R92,R135,R146 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R124 | |
| 2001-000315 | R-CARBON:120Kohm,2%,1/4W, | 2 | R102,R111 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 8 | R3-10 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 3 | R1,R94,R122 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 5 | R42,R53-54,R57,R86 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 2 | R87,R93 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 3 | R136-137,R145 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 5 | R37,R40,R69,R71-72 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 11 | R78-85,R91,R95,R103 | |
| 2001-000467 | R-CARBON:2.7Kohm,2%,1/4W, | 2 | R99-100 | |
| 2001-000532 | R-CARBON:240ohm,2%,1/4W,A | 1 | R115 | |
| 2001-000543 | R-CARBON:270Kohm,2%,1/4W, | 2 | R134,142 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 2 | R96,R132 | |
| 2001-000620 | R-CARBON:300Kohm,2%,1/4W, | 1 | R129 | |
| 2001-000648 | R-CARBON:330ohm,2%,1/4W,A | 1 | R144 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 2 | R127,R140 | |
| 2001-000675 | R-CARBON:36Kohm,2%,1/4W,A | 2 | R133,R141 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 22 | R32-36,R43-52,R61-67 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 3 | R76-77,R110 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 4 | R113,R117,R121,R125 | |
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 2 | R101,R138 | |
| 2001-000859 | R-CARBON:56Kohm,2%,1/4W,A | 1 | R143 | |
| 2001-000905 | R-CARBON:62Kohm,2%,1/4W,A | 1 | R105 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R23 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 2 | R128,R139 | |
| 2001-001011 | R-CARBON:9.1Kohm,2%,1/4W, | 1 | R116 | |
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 5 | R38,R56,R58,R60,R70 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-001028 | R-CARBON:91Kohm,2%,1/4W,A | 4 | R74,R88,R104,R114 | |
| 2011-000284 | R-NETWORK:1Kohm,2%,1/8W,A | 2 | RA6-7 | |
| 2201-000357 | C-CERAMIC,DISC:20pF,5%,50 | 1 | C135 | |
| 2201-000357 | C-CERAMIC,DISC:20pF,5%,50 | 4 | C124-125,C183-184 | |
| 2201-000376 | C-CERAMIC,DISC:220pF,5%,5 | 1 | C140 | |
| 2201-000464 | C-CERAMIC,DISC:30pF,5%,50 | 3 | C176,C178,C196 | |
| 2201-000558 | C-CERAMIC,DISC:470pF,10%, | 2 | C108,C152 | |
| 2201-000642 | C-CERAMIC,DISC:680pF,10%, | 7 | C83-86,C104,C106-107 | |
| 2201-000642 | C-CERAMIC,DISC:680pF,10%, | 1 | C195 | |
| 2202-000603 | C-CERAMIC,MLC-RADIAL:1uF, | 1 | C1 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 5 | C99-103,C73 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 5 | C43,C61-63,C66 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 3 | C130,C138,C145 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 10 | C89-90,C92-97,C69,71 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 18 | C109,C118-123,C126 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C146-147,C149-150 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 9 | C153,C156-162,C164 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 6 | C168,C170-173,C175 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C177,C179,C180,C182 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 3 | C186,C193-194 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 2 | C128,C154 | |
| 2202-000675 | C-CERAMIC,MLC-RADIAL:10nF | 1 | C136 | |
| 2202-000686 | C-CERAMIC,MLC-RADIAL:1nF, | 1 | C151 | |
| 2301-000175 | C-FILM,PEF:15nF,5%,50V,7. | 2 | C131,C148 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 4 | C165-166,C174,C181 | |
| 2301-000335 | C-FILM,PEF:10nF,5%,50V,6. | 1 | C198 | |
| 2301-000335 | C-FILM,PEF:10nF,5%,50V,6. | 3 | C167,C169,C197 | |
| 2305-000128 | C-FILM,MPEF:100nF,10%,250 | 1 | C2 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 11 | C44-51,C65,C67,C72 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 1 | C74 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 8 | C3-10 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 32 | C11-42 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 10 | C53-60,C191,C199 | |
| 2401-000031 | C-AL:47uF,20%,16V,GP,6.3* | 1 | C133 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 10 | C75-82,C187,C190 | |
| 2401-000050 | C-AL:10uF,20%,16V,GP,5x11 | 2 | C192,163 | |
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 8 | C110-117 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 3 | C52,C188-189 | |
| 2503-000140 | C-NETWORK:220pF,5%,100V | 4 | CA1,CA3-5 | |
| 2801-000133 | CRYSTAL-UNIT:12.288MHz,50 | 1 | X1 | 0.002 |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 2 | X2,X4 | 0.002 |
| 2801-001365 | CRYSTAL-UNIT:32.768KHz,30 | 1 | X3 | 0.002 |
| 3301-000345 | CORE-FERRITE BEAD:ZZ,3.5x | 1 | L2 | |
| 3407-000121 | SWITCH-DIP:24V,300mA,SLID | 8 | SW1-8 | |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 8 | REL20-27 | 0.001 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 19 | REL1-19 | 0.001 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 2 | CN13-14 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN12 | |
| 3704-000189 | SOCKET-IC:20P,DIP,SN,2.54 | 1 | U33 | |
| 3704-000255 | SOCKET-IC:32P,DIP,SN,2.54 | 1 | U35 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 5 | U26-30 | |
| 3710-000107 | CONNECTOR-SHUNT:2P,1R,2.5 | 2 | CN9-10 | |
| 3711-001367 | CONNECTOR-HEADER:2WALL,20 | 5 | CN3-5,CN7-8 | |
| 3711-001479 | CONNECTOR-HEADER:NOWALL,3 | 2 | CN9-10 | |
| 3711-003103 | CONNECTOR-HEADER:2WALL,40 | 1 | CN6 | |
| 3722-000248 | JACK-MODULAR:6P/4C,-,AU30 | 1 | CN2 | |
| 4302-000126 | BATTERY-NICD(2ND):3.6V;1. | 1 | BAT1 | 0.002 |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 6 | SRW1-6 | |
| 6006-000130 | SCREW-ASS'Y MACH:WS,PH,+, | 1 | SRW | |
| 6021-000118 | NUT-HEXAGON:1C,M3,ZPC(YEL | 1 | NUT | |
| 881 703810TA | IC-LIN,3810,MELODY IC:TO- | 1 | U40 | |
| 887 190016SH | ,:-,-,-,-,-,-, | 4 | RA1-4 | |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 8 | U1-8 | 0.003 |
| 935 720053AA | CON-JACK PHONE:-,11.89X10 | 1 | CN1 | |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 8 | T18-25 | |
| GA13-10068A | IC-HYB:STA-1224,DANA/KP-0 | 8 | HIC17-24 | 0.001 |
| GA13-10070A | IC-HYB:EURO 816H,DANA/HYB | 2 | HIC25-26 | 0.001 |
| GA13-10099A | IC-HYB:SKP36HX,TYC/SLC-03 | 16 | HIC1-16 | 0.001 |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC35 | 0.001 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 25 | T1-17,T26-33 | 0.001 |
| GA62-30502A | HEAT SINK-TR:SKP-32H,A606 | 1 | U51 | |
| JF27-20050A | COIL-AF:KP32,300UH,0.35OH | 1 | L1 | |

# 5.4 NX-308 POWER B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01113A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 4 | D13-16 | 0.001 |
| 0402-000118 | DIODE-BRIDGE: 2F,200V,1. | 1 | BD1 | 0.001 |
| 0402-000155 | DIODE-RECTIFIER:1N5401,10 | 6 | D4-5,D18-21 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 1 | D8 | 0.001 |
| 0403-000141 | DIODE-ZENER:1N4735A,6.2V, | 2 | ZD2-3 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 2 | ZD5-6 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 2 | ZD1,ZD4 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 2 | Q5-6 | 0.002 |
| 0502-000360 | TR-POWER:TIP42C,PNP,-100V | 2 | Q8,Q10 | 0.002 |
| 0502-000392 | TR-POWER:TIP41C,NPN,100V, | 2 | Q3,Q9 | 0.002 |
| 0503-000104 | TR-DARLINGTON:2SB675,PNP, | 1 | Q1 | 0.001 |
| 1201-000188 | IC-OP AMP:1458,DIP,8P,300 | 1 | U8 | 0.001 |
| 1202-000162 | IC-VOLTAGE COMP.:393,DIP, | 2 | U5-6 | 0.001 |
| 1203-000123 | IC-NEGA.FIXED REG.:7661,D | 1 | U1 | 0.002 |
| 1203-000242 | IC-POSI.FIXED REG.:7812,T | 1 | U4 | 0.002 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U7 | 0.002 |
| 1203-000420 | IC-NEGA.FIXED REG.:7905,T | 1 | U2 | 0.002 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 1 | P2 | 0.001 |
| 1404-000129 | THERMISTOR:6.8ohm,-,-,-,- | 1 | P1 | 0.001 |
| 1405-000125 | VARISTOR:220V,4500A,17x4. | 1 | V1 | 0.002 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 2 | V4,V6 | 0.002 |
| 1405-000150 | VARISTOR:470V,4500A,17.5x | 2 | V2-3 | 0.002 |
| 1405-000158 | VARISTOR:56V,500A,13.5x4. | 1 | V5 | 0.002 |
| 2001-000102 | R-CARBON:1.8Kohm,2%,1/4W, | 1 | R33 | |
| 2001-000229 | R-CARBON:1.3Kohm,2%,1/4W, | 1 | R34 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 1 | R23 | |
| 2001-000437 | R-CARBON:1ohm,2%,1/4W,AA, | 2 | R44-45 | |
| 2001-000450 | R-CARBON:2.2Mohm,2%,1/4W, | 1 | R12 | |
| 2001-000518 | R-CARBON:22Kohm,2%,1/4W,A | 1 | R46 | |
| 2001-000536 | R-CARBON:24Kohm,2%,1/4W,A | 1 | R21 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 1 | R18 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000710 | R-CARBON:3Kohm,2%,1/4W,AA | 3 | R30-32 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R26-29 | |
| 2001-000805 | R-CARBON:5.6Kohm,2%,1/4W, | 1 | R25 | |
| 2001-000926 | R-CARBON:68Kohm,2%,1/4W,A | 1 | R15 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R24 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 1 | R14 | |
| 2003-000370 | R-METAL OXIDE:75ohm,5%,2W | 1 | R11 | |
| 2004-000813 | R-METAL:340Kohm,1%,1/4W,A | 1 | R36 | |
| 2004-000861 | R-METAL:39Kohm,1%,1/4W,AA | 1 | R38 | |
| 2004-001164 | R-METAL:62Kohm,1%,1/4W,AA | 4 | R39-R42 | |
| 2004-001296 | R-METAL:82Kohm,1%,1/4W,AA | 1 | R37 | |
| 2006-000173 | R-CEMENT:5ohm,5%,5W,CA,BK | 1 | R3 | |
| 2103-000146 | VR-SEMI:10Kohm,10%,1/2W,T | 1 | VR2 | |
| 2103-000445 | VR-SEMI:50Kohm,10%,1/2W,T | 1 | VR1 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 9 | C24-29,C42,C45-46 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 3 | C41,C43,C44 | |
| 2305-000164 | C-FILM,MPEF:10nF,10%,250V | 1 | C47 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 1 | C40 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 2 | C16-17 | |
| 2401-000025 | C-AL:100uF,20%,16V,GP,8x1 | 1 | C11 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 3 | C14-15,C39 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 4 | C7-9,C38 | |
| 2401-000109 | C-AL:10000uF,20%,50V,GP,2 | 1 | C33 | |
| 2401-000151 | C-AL:1000uF,20%,25V,GP,12 | 2 | C31,C32 | |
| 2401-000310 | C-AL:100uF,20%,25V,GP,8x1 | 1 | C10 | |
| 2401-000711 | C-AL:2200uF,20%,25V,GP,16 | 1 | C30 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 2 | C36-37 | |
| 2401-001430 | C-AL:470uF,20%,50V,GP,13* | 2 | C34,C35 | |
| 3601-000241 | FUSE-FERRULE:250V,2A,SLOW | 1 | FUS1 | 0.003 |
| 3601-000271 | FUSE-FERRULE:250V,3A,SLOW | 1 | FUS2 | 0.003 |
| 3602-000126 | FUSE-HOLDER:-,10A,20mohm | 2 | CN2,CN10 | |
| 3711-000118 | CONNECTOR-HEADER:1WALL,10 | 1 | CN14 | |
| 3711-000236 | CONNECTOR-HEADER:1WALL,4P | 1 | CN15 | |
| 3711-000265 | CONNECTOR-HEADER:1WALL,5P | 1 | CN16 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 3711-000961 | CONNECTOR-HEADER:BOX,4P,1 | 1 | CN17 | |
| 3711-002083 | CONNECTOR-HEADER:1WALL,2P | 1 | CN9 | |
| 6006-000130 | SCREW-ASS'Y MACH:WS,PH,+, | 4 | Q3,Q9,Q10,U4 | |
| 6021-000118 | NUT-HEXAGON:1C,M3,ZPC(YEL | 4 | Q3,Q4,Q10,U4 | |
| 935 810010AA | CON-TERMINAL,PLUG,TAB:TAB | 3 | CN11-13 | |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC1 | 0.003 |
| GA26-30071A | TRANS-POWER:TT-308H,7V//7 | 1 | T1 | 0.002 |
| GA62-30501A | HEAT SINK-TR:SKP-24D,A606 | 2 | HTS3-4 | |
| GA62-30502A | HEAT SINK-TR:SKP-32H,A606 | 2 | HTS1-2 | |
| JF27-20050A | COIL-AF:KP32,300UH,0.35OH | 1 | L1 | |

# 5.5 NX-820/1232 POWER B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01123A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 8 | D9-16 | 0.001 |
| 0402-000118 | DIODE-BRIDGE: 2F,200V,1. | 1 | BD1 | 0.001 |
| 0402-000155 | DIODE-RECTIFIER:1N5401,10 | 3 | D4-6 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 2 | D7-8 | 0.001 |
| 0403-000141 | DIODE-ZENER:1N4735A,6.2V, | 4 | ZD2-5 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 2 | ZD6-7 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD1 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 3 | Q4-6 | 0.002 |
| 0502-000360 | TR-POWER:TIP42C,PNP,-100V | 2 | Q7-8 | 0.002 |
| 0502-000392 | TR-POWER:TIP41C,NPN,100V, | 2 | Q2-3 | 0.002 |
| 0503-000104 | TR-DARLINGTON:2SB675,PNP, | 1 | Q1 | 0.002 |
| 1201-000188 | IC-OP AMP:1458,DIP,8P,300 | 2 | U7-8 | 0.002 |
| 1202-000162 | IC-VOLTAGE COMP.:393,DIP, | 2 | U5-6 | 0.002 |
| 1203-000123 | IC-NEGA.FIXED REG.:7661,D | 1 | U1 | 0.002 |
| 1203-000242 | IC-POSI.FIXED REG.:7812,T | 1 | U4 | 0.002 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U3 | 0.002 |
| 1203-000420 | IC-NEGA.FIXED REG.:7905,T | 1 | U2 | 0.002 |
| 1404-000129 | THERMISTOR:6.8ohm,-,-,-,- | 1 | P1 | 0.003 |
| 1405-000125 | VARISTOR:220V,4500A,17x4. | 1 | V1 | 0.003 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 2 | V4,V6 | 0.003 |
| 1405-000150 | VARISTOR:470V,4500A,17.5x | 2 | V2-3 | 0.003 |
| 1405-000158 | VARISTOR:56V,500A,13.5x4. | 1 | V5 | 0.003 |
| 2001-000102 | R-CARBON:1.8Kohm,2%,1/4W, | 1 | R33 | |
| 2001-000229 | R-CARBON:1.3Kohm,2%,1/4W, | 1 | R34 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R22-23 | |
| 2001-000437 | R-CARBON:1ohm,2%,1/4W,AA, | 2 | R35-36 | |
| 2001-000450 | R-CARBON:2.2Mohm,2%,1/4W, | 1 | R12 | |
| 2001-000518 | R-CARBON:22Kohm,2%,1/4W,A | 1 | R37 | |
| 2001-000536 | R-CARBON:24Kohm,2%,1/4W,A | 2 | R20-21 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 1 | R18 | |
| 2001-000697 | R-CARBON:39Kohm,2%,1/4W,A | 1 | R17 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000710 | R-CARBON:3Kohm,2%,1/4W,AA | 3 | R30-R32 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R26-29 | |
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 1 | R16 | |
| 2001-000805 | R-CARBON:5.6Kohm,2%,1/4W, | 1 | R25 | |
| 2001-000926 | R-CARBON:68Kohm,2%,1/4W,A | 1 | R15 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R24 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 1 | R14 | |
| 2001-000996 | R-CARBON:82Kohm,2%,1/4W,A | 1 | R13 | |
| 2003-000370 | R-METAL OXIDE:75ohm,5%,2W | 1 | R11 | |
| 2004-000813 | R-METAL:340Kohm,1%,1/4W,A | 1 | R4 | |
| 2004-000861 | R-METAL:39Kohm,1%,1/4W,AA | 1 | R10 | |
| 2004-001164 | R-METAL:62Kohm,1%,1/4W,AA | 4 | R6-9 | |
| 2004-001296 | R-METAL:82Kohm,1%,1/4W,AA | 1 | R5 | |
| 2006-000145 | R-CEMENT:10ohm,5%,5W,CA,B | 1 | R3 | |
| 2103-000146 | VR-SEMI:10Kohm,10%,1/2W,T | 1 | VR2 | |
| 2103-000445 | VR-SEMI:50Kohm,10%,1/2W,T | 1 | VR1 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 8 | C20-21,C24-29 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 3 | C19,C22,C23 | |
| 2305-000164 | C-FILM,MPEF:10nF,10%,250V | 1 | C30 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 1 | C18 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 2 | C16-17 | |
| 2401-000025 | C-AL:100uF,20%,16V,GP,8x1 | 1 | C11 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 4 | C12-15 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C7-9 | |
| 2401-000109 | C-AL:10000uF,20%,50V,GP,2 | 1 | C4 | |
| 2401-000151 | C-AL:1000uF,20%,25V,GP,12 | 2 | C2-3 | |
| 2401-000310 | C-AL:100uF,20%,25V,GP,8x1 | 1 | C10 | |
| 2401-000711 | C-AL:2200uF,20%,25V,GP,16 | 1 | C1 | |
| 2401-001430 | C-AL:470uF,20%,50V,GP,13* | 2 | C5-6 | |
| 3501-000170 | RELAY-MINIATURE:24V,360mW | 1 | REL1 | 0.001 |
| 3601-000241 | FUSE-FERRULE:250V,2A,SLOW | 1 | FUS1 | 0.003 |
| 3601-000271 | FUSE-FERRULE:250V,3A,SLOW | 1 | FUS2 | 0.003 |
| 3602-000126 | FUSE-HOLDER:-,10A,20mohm | 2 | CN1,CN2 | |
| 3711-000118 | CONNECTOR-HEADER:1WALL,10 | 1 | CN6 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 3711-000265 | CONNECTOR-HEADER:1WALL,5P | 2 | CN7-8 | |
| 3711-000961 | CONNECTOR-HEADER:BOX,4P,1 | 1 | CN10 | |
| 3711-002083 | CONNECTOR-HEADER:1WALL,2P | 1 | CN9 | |
| 6006-000130 | SCREW-ASS'Y MACH:WS,PH,+, | 5 | Q1-3,Q7,U4 | |
| 6021-000118 | NUT-HEXAGON:1C,M3,ZPC(YEL | 3 | Q1,Q2,Q7 | |
| 893 390138AA | DIODE-REC,RS403L,:-,4A,1V | 2 | BD2,BD3 | 0.001 |
| 935 810010AA | CON-TERMINAL,PLUG,TAB:TAB | 3 | CN3-5 | |
| GA26-30071A | TRANS-POWER:TT-308H,7V//7 | 1 | T1 | 0.002 |
| GA62-30502A | HEAT SINK-TR:SKP-32H,A606 | 3 | HTS3-5 | |
| GA62-30510A | HEAT SINK TR:SKP-32H,A606 | 2 | HTS1-2 | |

# 5.6 NX-4SLI B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01139A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 12 | D2-6,D10-11,D13-17 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 9 | D21-22,D24-28,D32-33 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 7 | D35-39,D43-44 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 8 | D1,D7-9,D12,D18-20 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 6 | D23,D29-31,D34,D40 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 2 | D41,D42 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 8 | ZD2-ZD9 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD1 | 0.001 |
| 0501-000295 | TR-SMALL SIGNAL:KSA709,PN | 4 | Q5,Q8,Q11,Q14 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 8 | Q1-4,Q6-7,Q9-10 | 0.002 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 4 | Q12-13,Q15-16 | 0.002 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U3 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U2,U7 | 0.002 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U4-5 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U6 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U9 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 1 | U8 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 1 | P1 | 0.003 |
| 1405-000130 | VARISTOR:270V,1200A,9x4.6 | 4 | V1-4 | 0.003 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 4 | V5-8 | 0.003 |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 2 | R46-47 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 9 | R8-10,R18-20,R28-30 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R38-40,R50,R52 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R48 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R51,R53 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 5 | R1,R7,R11,R17,R21 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 3 | R27,R31,R37 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 5 | R4,R6,R14,R16,R24 | |
| 2001-000558 | R-CARBON:27Kohm,2%,1/4W,A | 3 | R26,R34,R36 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R42-45 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 1 | R49 | |
| 2001-000859 | R-CARBON:56Kohm,2%,1/4W,A | 4 | R5,R15,R25,R35 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R41 | |
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 6 | R2-3,R12-13,R22-23 | |
| 2003-000162 | R-METAL OXIDE:120ohm,5%,2 | 2 | R32-33 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 13 | C1-13 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 1 | C14 | |
| 2401-000023 | C-AL:1uF,20%,50V,GP,5*11m | 4 | C25,C29,C33,C37 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 3 | C15-17 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C21 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 5 | C24,C26,C28,C30,C32 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 3 | C34,C36,C38 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C18-20 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C22 | |
| 2401-001757 | C-AL:22uF,20%,16V,GP,5x7m | 4 | C23,C27,C31,C35 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 4 | REL1-REL4 | 0.002 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 6041-000110 | RIVET-BLIND:D3.25,L8.5,ZP | 2 | M1,M2 | |
| 887 190016SH | ,:-,-,-,-,-,-, | 1 | RA1 | |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC1 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 4 | T1-T4 | 0.002 |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |

# 5.7 NX-4KLI B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01137A | PBA:NEW ANALOG K/P,-,-,- | 1 | | |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 8 | ZD1-ZD8 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD9 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U6 | 0.001 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U2,U4 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 1 | U3 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U5 | 0.001 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,- | 5 | P1-5 | 0.001 |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R2,R3 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R1,R4 | |
| 2201-000558 | C-CERAMIC,DISC:470pF,10%, | 1 | C20 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 8 | C1-C8 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 6 | C9-C14 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C15,C16 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C17-C19 | |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 6041-000110 | RIVET-BLIND:D3.25,L8 | 2 | M1,M2 | |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 4 | T1,T3,T5,T7 | 0.001 |
| GA13-10070A | IC-HYB:EURO 816H,DANA/HYB | 1 | HIC1 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC2 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 4 | T2,T4,T6,T8 | 0.001 |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |
| JF27-60051A | COIL-FILTER:CF5400,60uH,5 | 1 | L1 | |

# 5.8 NX-2TRK B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01135A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 4 | D2-3,D5-6 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 2 | D1,D4 | 0.001 |
| 0403-000161 | DIODE-ZENER:1N4751A,30V,5 | 4 | ZD1-4 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 4 | ZD9-12 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD17 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 2 | Q1-Q2 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U3 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U4,U5 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U2,U6 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U8 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U13 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 1 | U7 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 1 | P1 | 0.003 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 6 | V1-V6 | 0.003 |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 2 | R12-13 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 2 | R15-16 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 4 | R2-3,R21,R23 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R6 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 2 | R28-29 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R1,R5 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 2 | R20,R22 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 2 | R10-11 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 1 | R7 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R14 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 12 | C1-12 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 1 | C13 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 2 | C14-15 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C41 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C37 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 3 | C24,C27,C38 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 5 | C18-19,C39-40,C42 | |
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 2 | C22,C25 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C34 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 2 | REL1-2 | 0.001 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 6041-000110 | RIVET-BLIND:D3.25,L8.5,ZP | 2 | M1,M2 | |
| 895 53 | 0229 OPT-COUPL,TR,PC817:5 | 2 | U9-10 | 0.002 |
| GA13-10068A | IC-HYB:STA-1224,DANA/KP-0 | 2 | HIC1-2 | 0.001 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC9 | 0.001 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 2 | T1-2 | 0.001 |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |

# 5.9 NX-4TRK B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01133A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 6 | D2-3,D5-6,D8-9 | 0.001 |
| 0401-000140 | DIODE-SWITCHING:1N4148,10 | 2 | D11-12 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 4 | D1,D4,D7,D10 | 0.001 |
| 0403-000161 | DIODE-ZENER:1N4751A,30V,5 | 8 | ZD1-8 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 8 | ZD9-ZD16 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD17 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 4 | Q1-Q4 | 0.002 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U3 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U4,U5 | 0.001 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U2,U6 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U8 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U13 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 1 | U7 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 1 | P1 | 0.003 |
| 1405-000141 | VARISTOR:390V,1200A,9x5.4 | 12 | V1-V12 | 0.003 |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 2 | R12,R13 | |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 4 | R15,R16,R18,R19 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 6 | R2-3,R21,R23,R25,R27 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R6 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 4 | R28-31 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R1,R5 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 4 | R20,R22,R24,R26 | |
| 2001-000437 | R-CARBON:1ohm,2%,1/4W,AA, | 1 | R4 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R8-11 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 1 | R7 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R14 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 12 | C1-12 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 1 | C13 | |
| 2305-000596 | C-FILM,MPEF:820nF,10%,250 | 4 | C14-C17 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C37 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 5 | C24,C27,C30,C33,C38 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C41 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 7 | C18-21,C39-40,C42 | |
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 4 | C22,C25,C28,C31 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C34 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 4 | REL1-4 | 0.002 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 4 | U9-12 | 0.002 |
| GA13-10068A | IC-HYB:STA-1224,DANA/KP-0 | 4 | HIC1-HIC4 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC9 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 4 | T1-T4 | 0.002 |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |

# 5.10 NX-4OPX B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01141A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 4 | D1-D4 | 0.001 |
| 0402-000350 | DIODE-RECTIFIER:1N4935,20 | 1 | D5 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 8 | ZD2-ZD9 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD1 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 4 | Q1-Q4 | 0.002 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U6 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U2,U5 | 0.002 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U3,U4 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U7 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U9 | 0.002 |
| 1203-000428 | IC-POSI.ADJUST REG.:2577, | 1 | U10 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 1 | U8 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,- | 1 | P1 | 0.002 |
| 1405-000125 | VARISTOR:220V,4500A,17x4. | 12 | V1-V12 | 0.003 |
| 1405-000164 | VARISTOR:68V,250A,9x4.2mm | 5 | V13-V17 | 0.003 |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 2 | R7,R8 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R3,R17 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R4 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R1-2 | |
| 2001-000573 | R-CARBON:2Kohm,2%,1/4W,AA | 1 | R14 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 4 | R9-R12 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 1 | R5 | |
| 2001-000775 | R-CARBON:470ohm,2%,1/4W,A | 1 | R15 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R6 | |
| 2001-000960 | R-CARBON:75Kohm,2%,1/4W,A | 1 | R13 | |
| 2003-000293 | R-METAL OXIDE:4.7Kohm,5%, | 1 | R16 | |
| 2202-000656 | C-CERAMIC,MLC-RADIAL:100n | 1 | C32 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 12 | C1-C8,C28-C31 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 1 | C33 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C17,C20 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 1 | C18 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C21-C23 | |
| 2401-000499 | C-AL:10uF,20%,63V,GP,6.3* | 8 | C9-C16 | |
| 2401-000966 | C-AL:22uF,20%,50V,GP,6.3* | 1 | C27 | |
| 2401-001216 | C-AL:4.7uF,20%,100V,GP,6. | 1 | C24 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C19 | |
| 2401-001442 | C-AL:470uF,20%,63V,GP,13x | 2 | C25,C26 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 4 | REL1-REL4 | 0.001 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 6006-000130 | SCREW-ASS'Y MACH:WS,PH,+, | 1 | SRW5 | |
| 6021-000118 | NUT-HEXAGON:1C,M3,ZPC(YEL | 1 | NUT1 | |
| 6041-000110 | RIVET-BLIND:D3.25,L8.5,ZP | 2 | M1,M2 | |
| 887 190016 | ,:-,-,-,-,-,-, | 1 | RA1 | |
| GA13-10100A | IC-HYB:STA-1224,TYC/SLC-0 | 4 | HIC2-HIC5 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC1 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 4 | T1-T4 | 0.001 |
| GA27-20052A | COIL-AF:SKP-612,170uH,-,7 | 1 | L1 | |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |

# 5.11 NX-8SLI B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01147A | PBA:NEW ANALOG K/P,-,-,- | 1 | | |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 8 | D1-D8 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 16 | ZD1-ZD16 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD17 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 8 | Q1-8 | 0.002 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U7 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U2,U5 | 0.002 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U3-4 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U6 | 0.001 |
| 1203-000263 | IC-POSI.FIXED REG.:7824,T | 1 | U9 | 0.002 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000469 | IC-DTMF RECEIVER:MT8870,D | 1 | U8 | 0.003 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,- | 1 | P1 | 0.003 |
| 1405-000130 | VARISTOR:270V,1200A,9x4.6 | 8 | V1-8 | 0.003 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 8 | V9-16 | 0.003 |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 2 | R8-9 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R2,R4 | |
| 2001-000298 | R-CARBON:10ohm,2%,1/4W,AA | 1 | R6 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R1,R3 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 8 | R10-17 | |
| 2001-000752 | R-CARBON:430Kohm,2%,1/4W, | 1 | R7 | |
| 2001-000941 | R-CARBON:7.5Kohm,2%,1/4W, | 1 | R5 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 13 | C1-11,C13-14 | |
| 2301-000332 | C-FILM,PEF:100nF,5%,50V,1 | 1 | C12 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 4 | C31,C33,C34,C38 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 16 | C15-30 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C35-37 | |
| 2401-001349 | C-AL:470uF,20%,10V,GP,10x | 1 | C32 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 8 | REL1-REL8 | 0.002 |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| 6041-000110 | RIVET-BLIND:D3.25,L8.5,ZP | 2 | M1,M2 | |
| 887 190016SH | ,:-,-,-,-,-,-, | 2 | RA1,RA2 | |
| GA13-10099A | IC-HYB:SKP36HX,TYC/SLC-03 | 8 | HIC1-8 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC11 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 8 | T1-T8 | 0.001 |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |

# 5.12 NX-8KLI B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01145A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 16 | ZD1-16 | 0.001 |
| 0403-000548 | DIODE-ZENER:1N5339,5.6V,5 | 1 | ZD17 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U7 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 2 | U2,U5 | 0.002 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 2 | U3,U4 | 0.001 |
| 0801-000900 | IC-CMOS LOGIC:74HC04,INVE | 1 | U6 | 0.001 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1404-000126 | THERMISTOR:4.85ohm,-,-,-, | 9 | P1-P9 | 0.003 |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 2 | R1,R2 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R3-4 | |
| 2201-000558 | C-CERAMIC,DISC:470pF,10%, | 1 | C27 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 9 | C1-9 | |
| 2305-000559 | C-FILM,MPEF:100nF,10%,63V | 12 | C10-17,C23-26 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C18,C19 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 3 | C20-22 | |
| 3702-000174 | CONNECTOR-RIBBON:50P,FEMA | 1 | CN2 | |
| 3703-000191 | CONNECTOR-DIN:64P,2R,MALE | 1 | CN1 | |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 6002-000154 | SCREW-TAPPING:PH,+,2,M3,L | 4 | SRW1-4 | |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 6 | T1,T3,T5,T7,T9,T11 | 0.001 |
| EC26-20501A | TRANS-AF:INFOREX,-,800mH | 2 | T13,T15 | 0.001 |
| GA13-10070A | IC-HYB:EURO 816H,DANA/HYB | 2 | HIC1-2 | 0.002 |
| GA13-10108A | IC-HYB:SKP-308,SANK/SI820 | 1 | HIC3 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 6 | T2,T4,T6,T8,T10,T12 | 0.001 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 2 | T14,T16 | 0.001 |
| GA64-30500A | LOCKER-LATCH:SKP-816,-,WH | 1 | LOK | |
| GA70-10691A | IPR-STIFFENER B:NEW ANA | 1 | S1 | |
| JF27-60051A | COIL-FILTER:CF5400,60uH,5 | 1 | L1 | |

# 5.13 NX-DOORPHONE/PAGING B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01115A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0402-000165 | DIODE-RECTIFIER:1N5819,40 | 2 | D3-4 | 0.001 |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 2 | D1,D2 | 0.001 |
| 0403-000223 | DIODE-ZENER:1N749A,4.3V,5 | 6 | ZD1-6 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 2 | Q1-2 | 0.002 |
| 0801-000412 | IC-CMOS LOGIC:74HC32,OR G | 1 | U10 | 0.001 |
| 0801-000485 | IC-CMOS LOGIC:74HCT138,3- | 1 | U5 | 0.002 |
| 0801-000526 | IC-CMOS LOGIC:74HCT374,D | 3 | U2-3,U9 | 0.002 |
| 0801-000711 | IC-CMOS LOGIC:74HC244,BUF | 1 | U4 | 0.001 |
| 0801-000902 | IC-CMOS LOGIC:74HC02,NOR | 1 | U7 | 0.001 |
| 0801-000922 | IC-CMOS LOGIC:74HCT125,BU | 1 | U8 | 0.001 |
| 1002-001004 | IC-A/D&D/A CONVERTER:MSM6 | 2 | U11-12 | 0.001 |
| 1106-000137 | IC-SRAM:681000,128KX8BIT, | 2 | U13-14 | 0.001 |
| 1201-000250 | IC-OP AMP:3403,DIP,14P,30 | 1 | U6 | 0.002 |
| 1202-000115 | IC-VOLTAGE COMP.:8054,TO- | 1 | U15 | 0.001 |
| 1205-000149 | IC-CROSSPOINT SWITCH:M349 | 1 | U1 | 0.005 |
| 1205-000337 | IC-TONE DETECTOR:SSI75T98 | 1 | U16 | 0.001 |
| 1405-000137 | VARISTOR:33V,250A,14x8.5m | 2 | V1-2 | 0.003 |
| 2001-000103 | R-CARBON:220ohm,2%,1/4W,A | 1 | R10 | |
| 2001-000216 | R-CARBON:1.2Kohm,2%,1/4W, | 3 | R23,R26-27 | |
| 2001-000237 | R-CARBON:1.5Kohm,2%,1/4W, | 1 | R22 | |
| 2001-000267 | R-CARBON:100Kohm,2%,1/4W, | 1 | R34 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R11,R14,R30,R33,R35 | |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 1 | R36 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 4 | R8-9,R1-2 | |
| 2001-000364 | R-CARBON:15Kohm,2%,1/4W,A | 1 | R31 | |
| 2001-000436 | R-CARBON:1ohm,0%,1/4W,AA, | 2 | R24,R28 | |
| 2001-000500 | R-CARBON:20ohm,2%,1/4W,AA | 1 | R18 | |
| 2001-000536 | R-CARBON:24Kohm,2%,1/4W,A | 2 | R19-20 | |
| 2001-000620 | R-CARBON:300Kohm,2%,1/4W, | 4 | R4,R6,R29,R32 | |
| 2001-000629 | R-CARBON:30Kohm,2%,1/4W,A | 2 | R5,R7 | |
| 2001-000648 | R-CARBON:330ohm,2%,1/4W,A | 1 | R3 | |

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 2 | R12-13 | |
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 1 | R17 | |
| 2001-000853 | R-CARBON:560ohm,2%,1/4W,A | 1 | R21 | |
| 2001-000870 | R-CARBON:5Kohm,2%,1/4W,AA | 2 | R15-16 | |
| 2001-000973 | R-CARBON:8.2Kohm,2%,1/4W, | 1 | R25 | |
| 2011-000203 | R-NETWORK:10Kohm,5%,1/8W, | 1 | RA1 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 16 | C1-14,C16,C20 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 3 | C22-24, | |
| 2202-000675 | C-CERAMIC,MLC-RADIAL:10nF | 2 | C25-26 | |
| 2202-000686 | C-CERAMIC,MLC-RADIAL:1nF, | 4 | C18,C21,C31,C34 | |
| 2301-000353 | C-FILM,PEF:4.7nF,5%,50V,8 | 1 | C29 | |
| 2301-000356 | C-FILM,PEF:47nF,5%,50V,7. | 3 | C30,C32-33 | |
| 2305-000128 | C-FILM,MPEF:100nF,10%,250 | 2 | C27-28 | |
| 2401-000025 | C-AL:100uF,20%,16V,GP,8x1 | 1 | C43 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 3 | C41,C44,C46 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C42,C45 | |
| 2401-000031 | C-AL:47uF,20%,16V,GP,6.3* | 1 | C39 | |
| 2401-000032 | C-AL:100uF,20%,50V,GP,10x | 1 | C40 | |
| 2401-000499 | C-AL:10uF,20%,63V,GP,6.3* | 4 | C35-38 | |
| 2801-001363 | CRYSTAL-UNIT:3.579545MHz, | 1 | X1 | 0.002 |
| 3501-000381 | RELAY-MINIATURE:24V,200mW | 2 | REL1,REL2 | 0.002 |
| 3704-000275 | SOCKET-IC:40P,DIP,SN,2.54 | 1 | U1 | |
| 3710-000107 | CONNECTOR-SHUNT:2P,1R,2.5 | 1 | CN7 | |
| 3710-001047 | CONNECTOR-SOCKET:40P,2R,2 | 1 | CN1 | |
| 3711-001479 | CONNECTOR-HEADER:NOWALL,3 | 1 | CN7 | |
| 3722-000248 | JACK-MODULAR:6P/4C,-,AU30 | 4 | CN2-5 | |
| 4302-000126 | BATTERY-NICD(2ND):3.6V;1. | 1 | BAT1 | 0.002 |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 2 | U17-18 | 0.002 |
| 897 130505AB | VARI,:1.5V,-,0.3W,-, | 1 | V3 | 0.001 |
| 935 720053AA | CON-JACK PHONE:-,11.89X10 | 1 | CN6 | |
| GA13-10099A | IC-HYB:SKP36HX,TYC/SLC-03 | 2 | HIC1-2 | 0.002 |
| GA26-50053A | TRANS-MATCHING:EUEO 816,1 | 3 | T1-3 | 0.001 |

# 5.14 NX-SMDR/R-MMC B'D

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01117A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 1006-000275 | IC-LINE DRIVER:1488,DIP,1 | 1 | U2 | 0.002 |
| 1006-000283 | IC-LINE RECEIVER:1489,DIP | 1 | U3 | 0.002 |
| 1203-000123 | IC-NEGA.FIXED REG.:7661,D | 1 | U1 | 0.001 |
| 2001-000276 | R-CARBON:100ohm,2%,1/4W,A | 8 | R1-8 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 3 | C1-C3 | |
| 2401-000028 | C-AL:10uF,20%,50V,GP,5*11 | 2 | C4-C5 | |
| 3710-000317 | CONNECTOR-SOCKET:20P,2R,2 | 1 | CN1 | |
| 935 100109FA | CON-D-SUB,9P,RECEPTACLE:A | 2 | CN2,CN3 | |

# 5.15 NX-MPD B'D

## 5.15.1 12 kHz

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | FFR |
|---|---|---|---|---|
| GA92-01129A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0801-000918 | IC-CMOS LOGIC:74HCT139,LI | 1 | U1 | 0.002 |
| 0801-000922 | IC-CMOS LOGIC:74HCT125,BU | 1 | U2 | 0.001 |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C1,C2,C7,C8 | |
| 2305-000332 | C-FILM,MPEF:3.3nF,2%,200V | 4 | C3-C6 | |
| 3710-000317 | CONNECTOR-SOCKET:20P | 1 | CN1 | |
| GA13-10564A | IC-HYB:TARGET,KP-MPD,SIP, | 2 | HIC1-2 | 0.001 |

## 5.15.1 16 kHz

| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | |
|---|---|---|---|---|
| GA92-01131A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0801-000918 | IC-CMOS LOGIC:74HCT139,LI | 1 | U1 | 0.002 |
| 0801-000922 | IC-CMOS LOGIC:74HCT125,BU | 1 | U2 | 0.001 |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 4 | C1,C2,C7,C8 | |
| 2305-000332 | C-FILM,MPEF:3.3nF,2%,200V | 4 | C3-C6 | |
| 3710-000317 | CONNECTOR-SOCKET:20P | 1 | CN1 | |
| GA13-10004A | IC-ASIC:DCS/COMPACT EURO, | 2 | HIC1-2 | 0.001 |

# 5.16 NX-PRS B'D

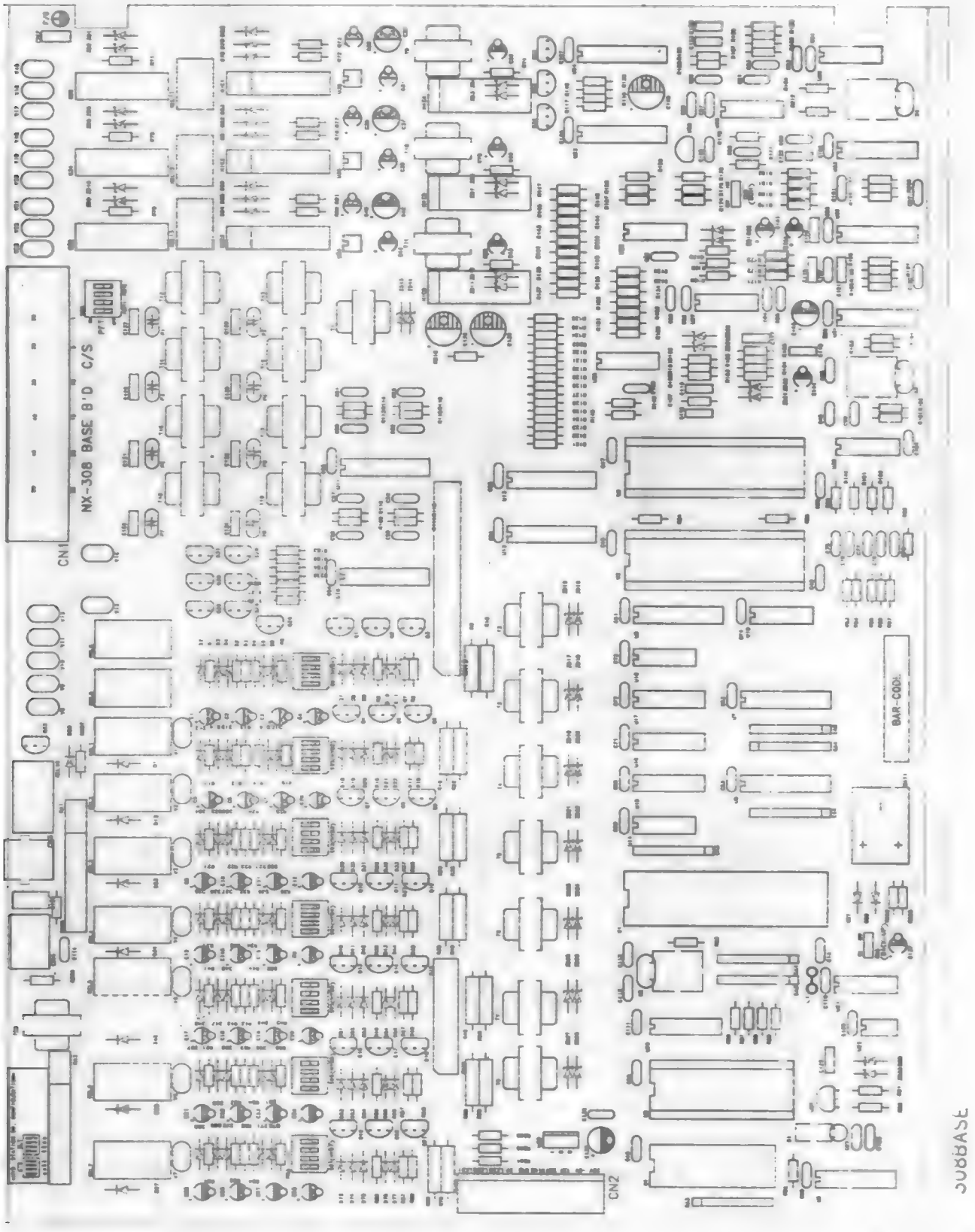
| SEC CODE | DESCRIPTION | Q'TY | COMPONENT NAME | |
|---|---|---|---|---|
| GA92-01127A | PBA:NEW ANALOG K/P,-,-,-, | 1 | | |
| 0402-000345 | DIODE-RECTIFIER:1N4004,40 | 4 | D1-D4 | 0.001 |
| 0501-000332 | TR-SMALL SIGNAL:KSC1009,N | 2 | Q1,Q2 | 0.002 |
| 0801-000913 | IC-CMOS LOGIC:74HC74,D FL | 1 | U6 | 0.001 |
| 0801-000918 | IC-CMOS LOGIC:74HCT139,LI | 1 | U2 | 0.002 |
| 0801-000922 | IC-CMOS LOGIC:74HCT125,BU | 1 | U1 | 0.001 |
| 1202-000162 | IC-VOLTAGE COMP.:393,DIP, | 1 | U3 | 0.002 |
| 2001-000284 | R-CARBON:10Kohm,2%,1/4W,A | 5 | R1-3,R6-7 | |
| 2001-000327 | R-CARBON:12Kohm,2%,1/4W,A | 2 | R4,R8 | |
| 2001-000358 | R-CARBON:150ohm,2%,1/4W,A | 2 | R15-16 | |
| 2001-000393 | R-CARBON:180Kohm,2%,1/4W, | 2 | R10,R13 | |
| 2001-000423 | R-CARBON:1Kohm,2%,1/4W,AA | 2 | R12,R19 | |
| 2001-000654 | R-CARBON:33Kohm,2%,1/4W,A | 2 | R11,R14 | |
| 2001-000726 | R-CARBON:4.7Kohm,2%,1/4W, | 2 | R17,R18 | |
| 2001-000781 | R-CARBON:47Kohm,2%,1/4W,A | 2 | R5,R9 | |
| 2201-000376 | C-CERAMIC,DISC:220pF,5%,5 | 2 | C11-12 | |
| 2202-000658 | C-CERAMIC,MLC-RADIAL:100n | 8 | C1-3,C6-10 | |
| 2202-000686 | C-CERAMIC,MLC-RADIAL:1nF, | 2 | C4-5 | |
| 3501-000380 | RELAY-MINIATURE:24V,400mW | 2 | REL1-2 | 0.002 |
| 3710-000317 | CONNECTOR-SOCKET:20P,2R,2 | 1 | CN1 | |
| 895 530002AA | OPT-COUPL,TR,PC817:50%,12 | 2 | U4-5 | 0.002 |

# 4.PBA LAYOUT

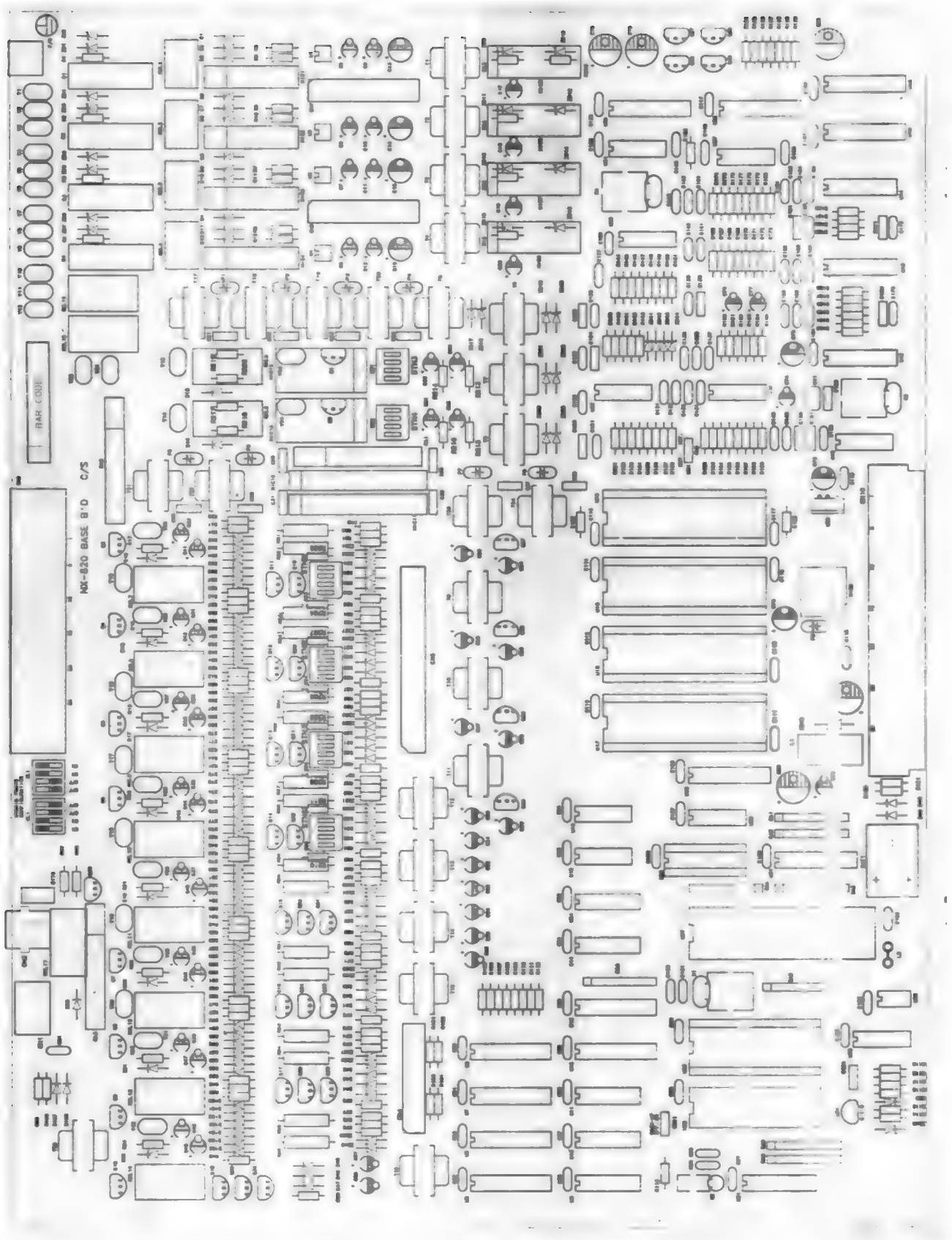
4.1 NX-308 BASE B'D.....4-1
4.2 NX-820 BASE B'D.....4-2
4.3 NX-1232 BASE B'D.....4-3
4.4 NX-308 POWER B'D.....4-4
4.5 NX-820/1232 POWER B'D.....4-5
4.6 NX-4SLI EXP B'D.....4-6
4.7 NX-4KLI EXP B'D.....4-7
4.8 NX-2TRK/4TRK B'D.....4-8
4.9 NX-4OPX B'D.....4-9
4.10NX-8SLI EXP B'D.....4-10
4.11NX-8KLI EXP B'D.....4-11
4.12NX-SMDR / R-MMC B'D.....4-12
4.13NX-MPD B'D.....4-13
4.14NX-PRS D-B'D.....4-14
4.15NX-DOOR/PAGING B'D.....4-15
4.16NX-DOOR/PAGING W/VMS B'D.....4-16

# 4. PBA LAYOUT

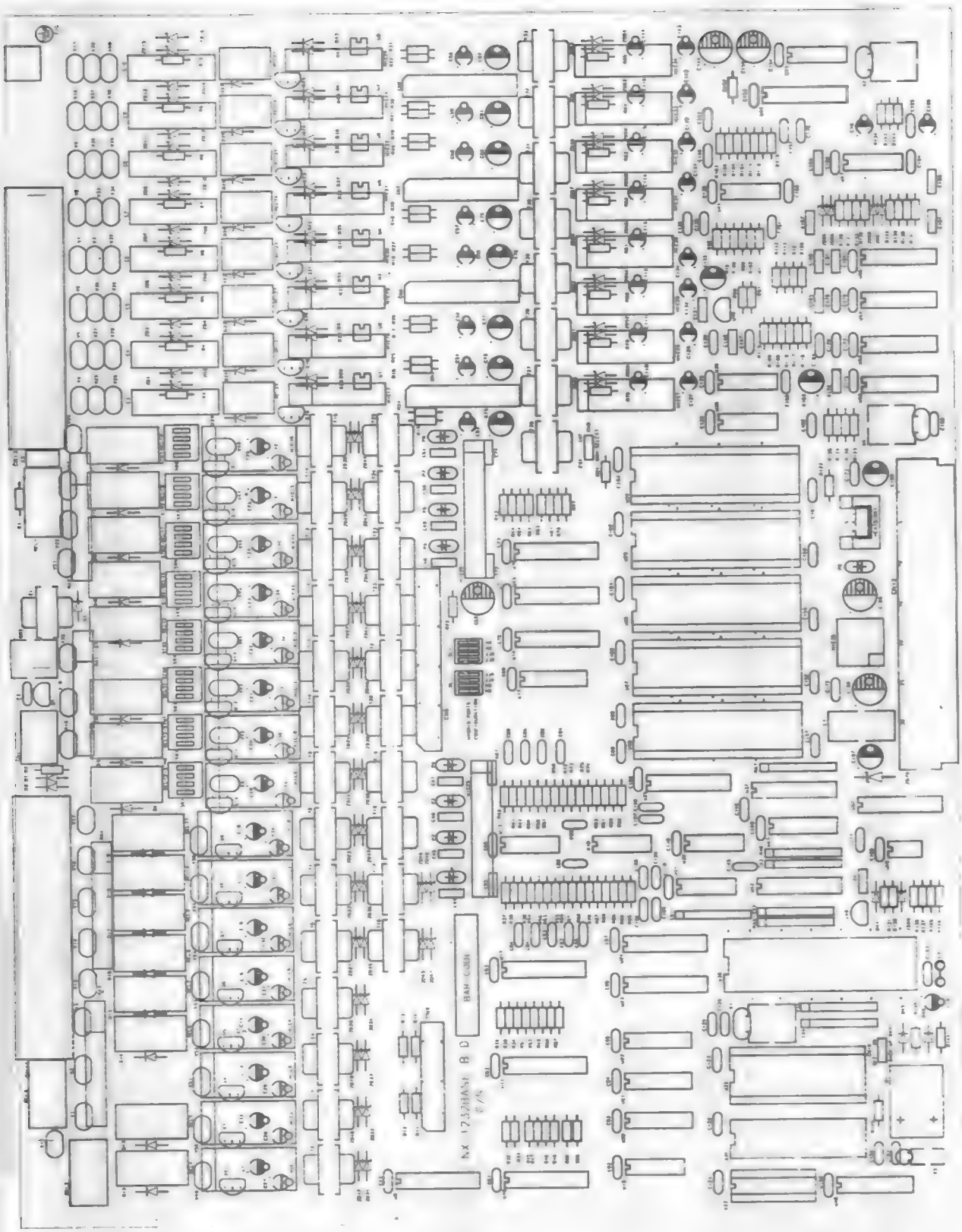
## 4 . 1NX-308 BASE B'D



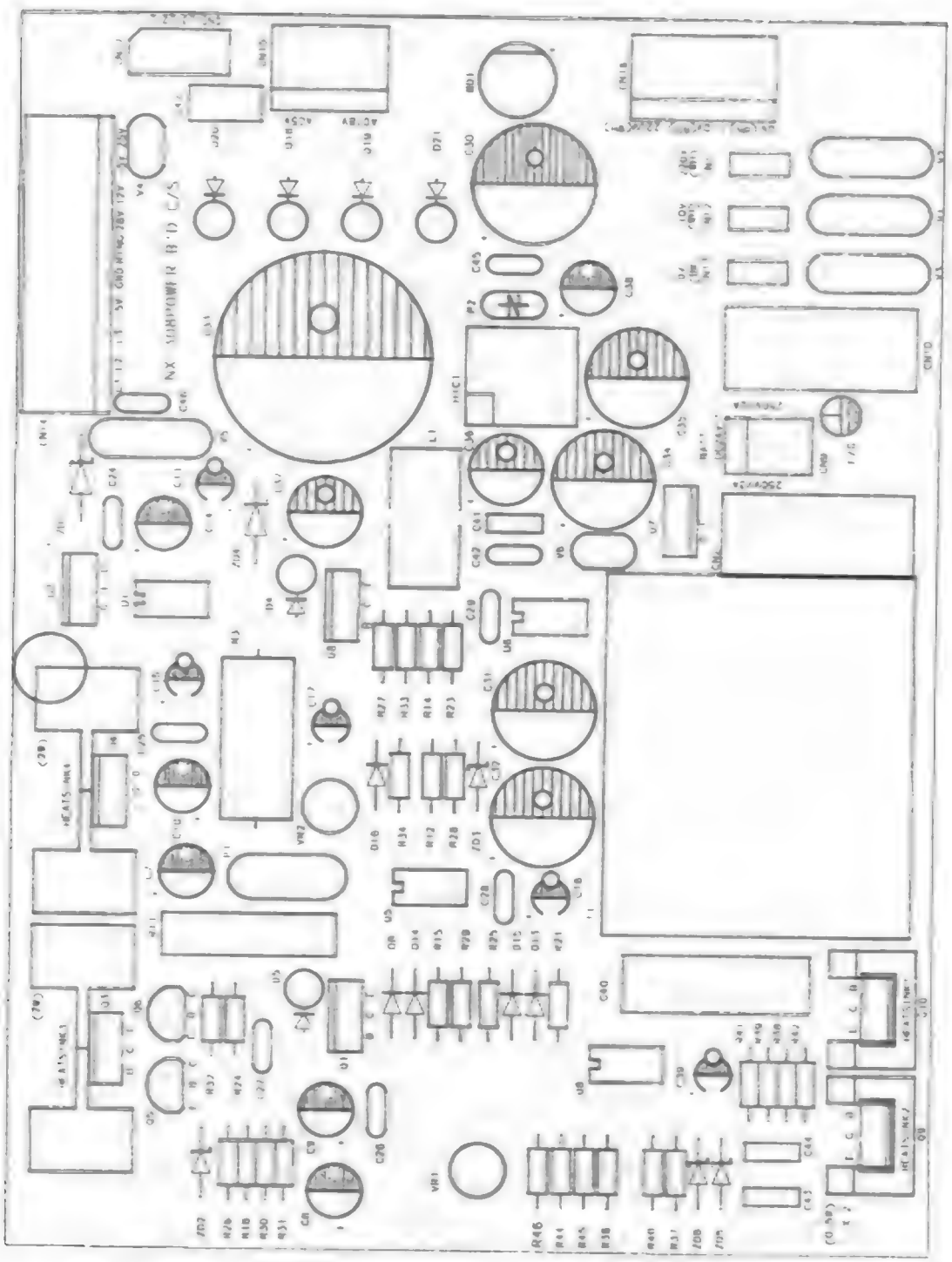
# 4.2 NX-820 BASE B'D



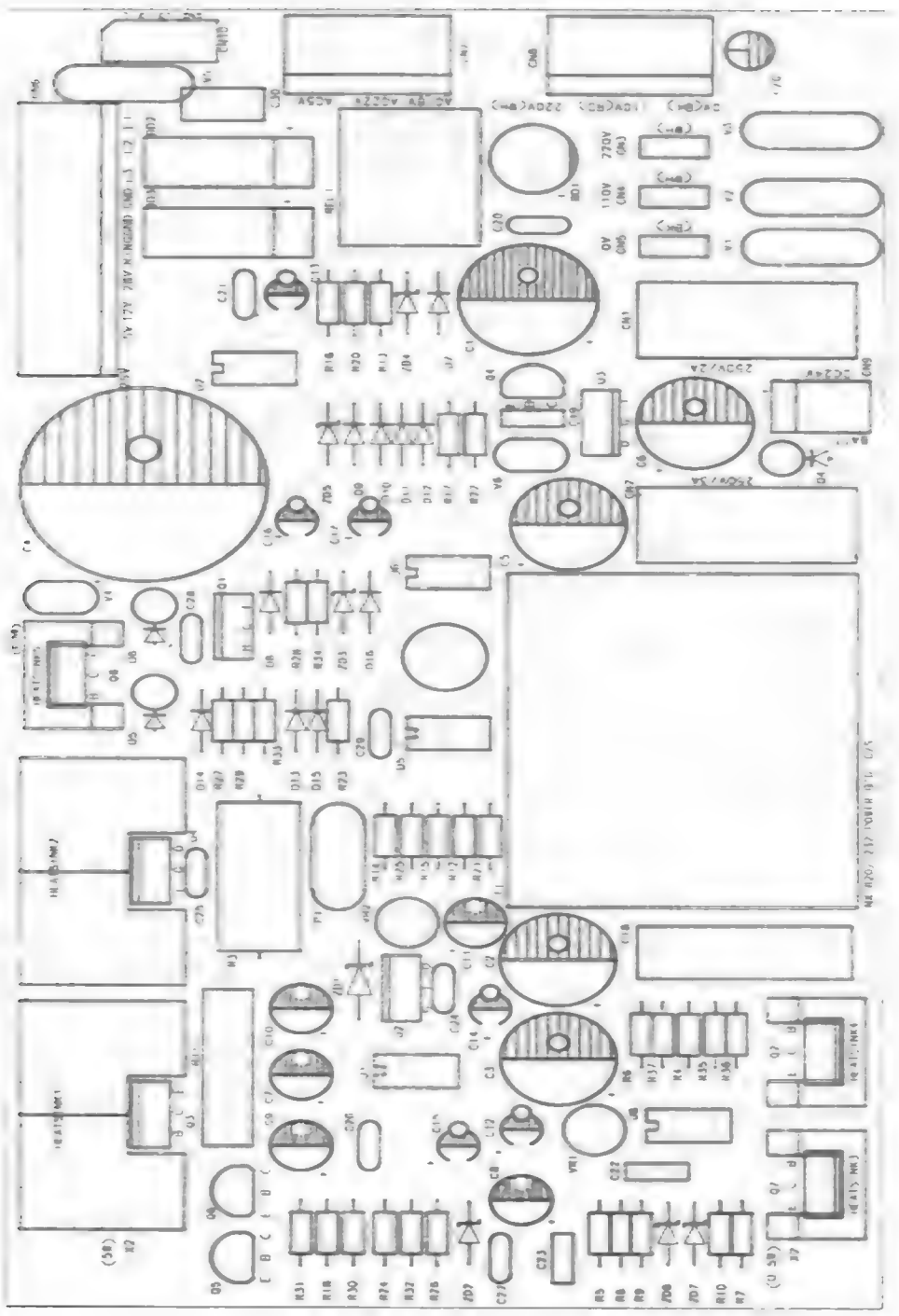
# 4.3 NX-1232 BASE B'D



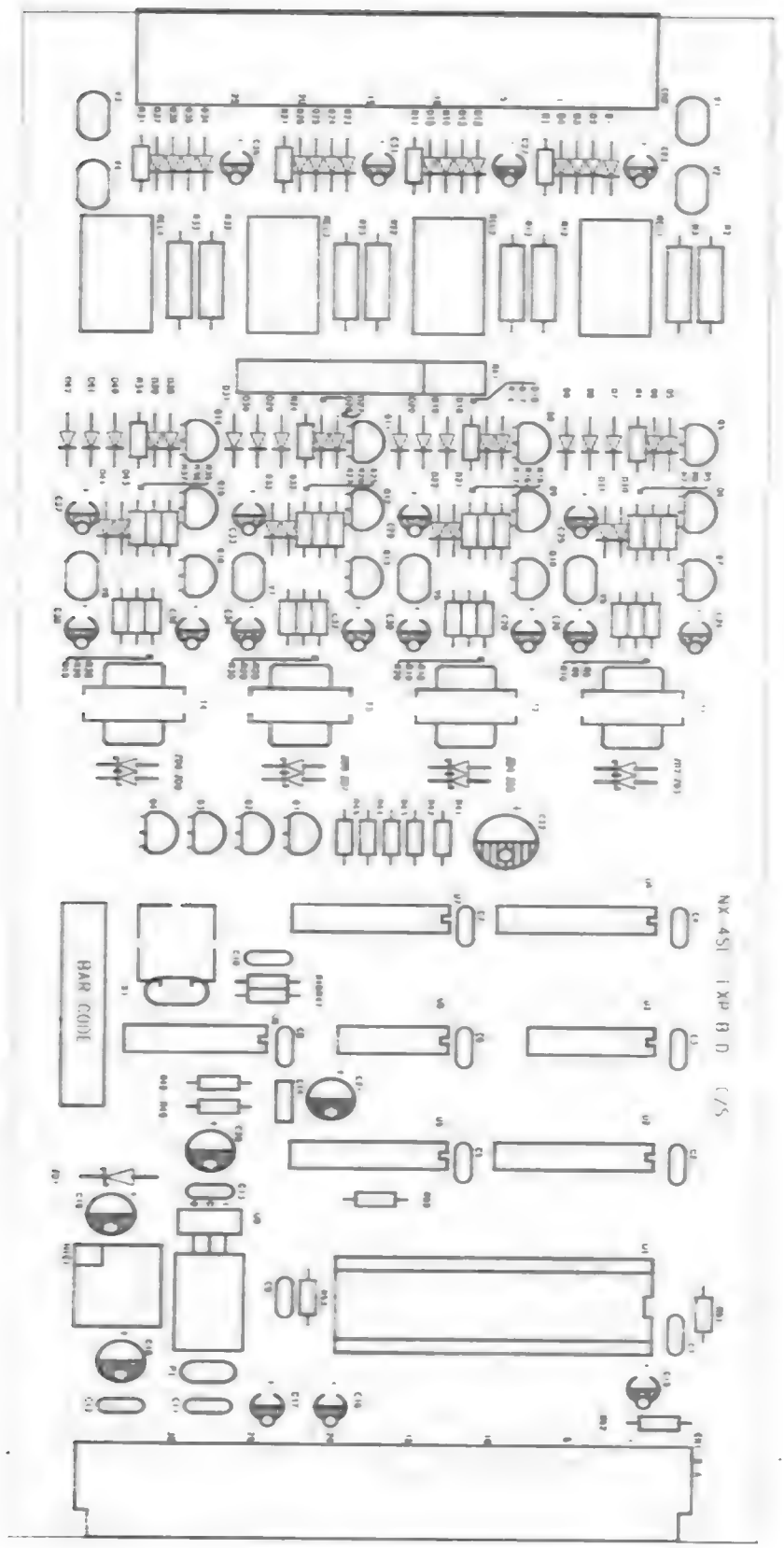
# 4.4 NX-308 POWER B'D



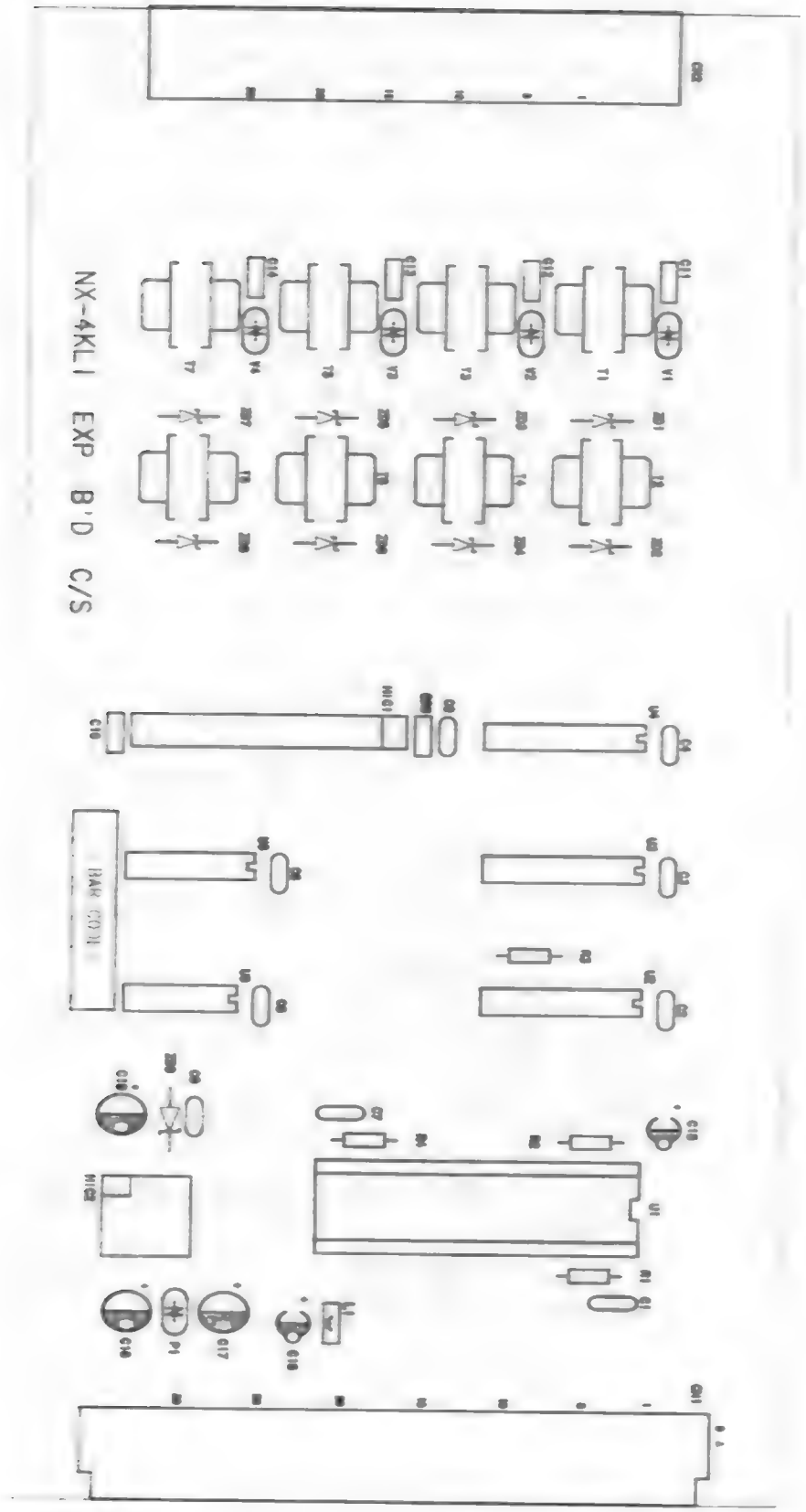
# 4.5 NX-820/1232 POWER B'D



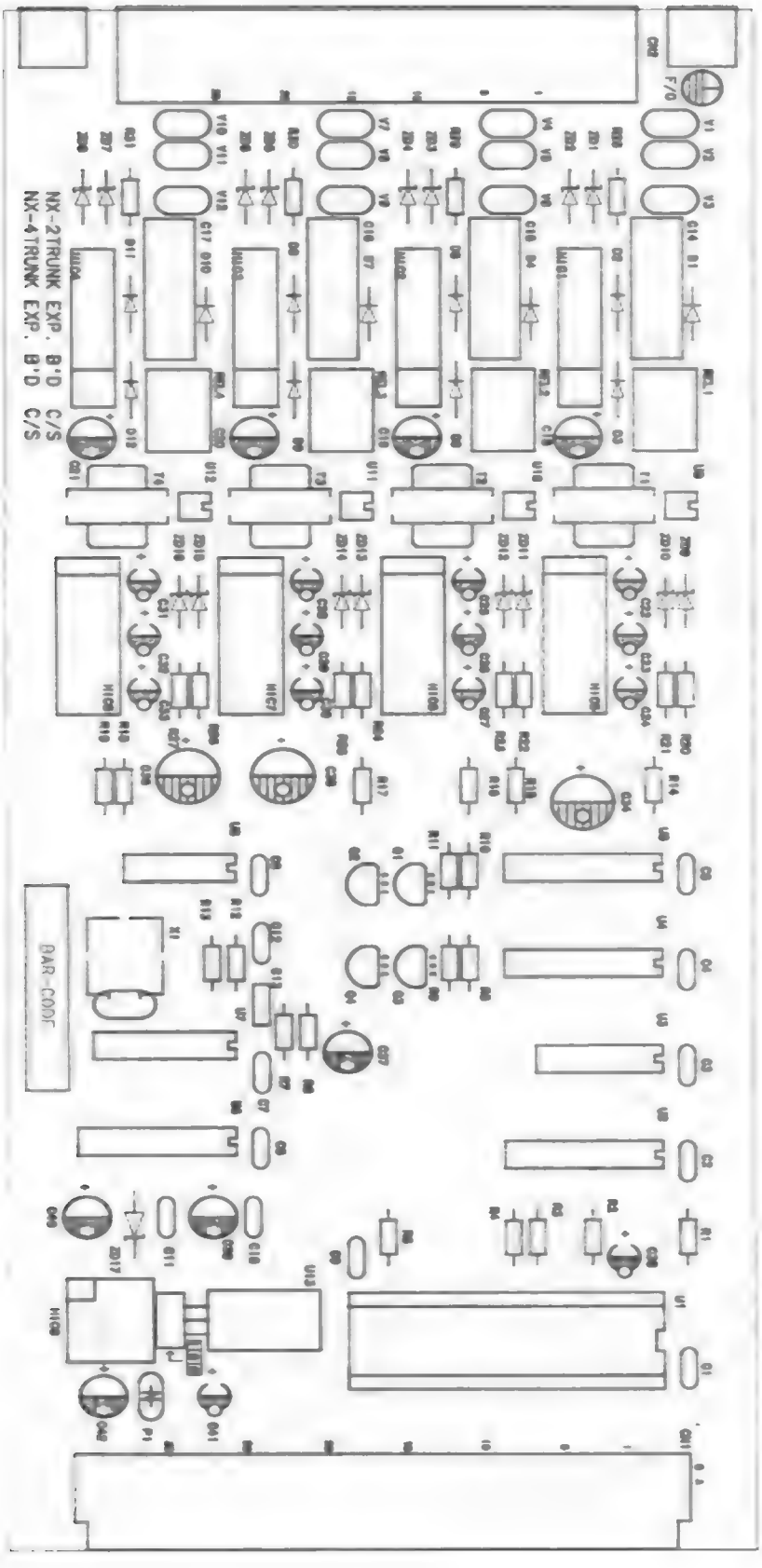
# 4.6 NX-4SLI EXP B'D



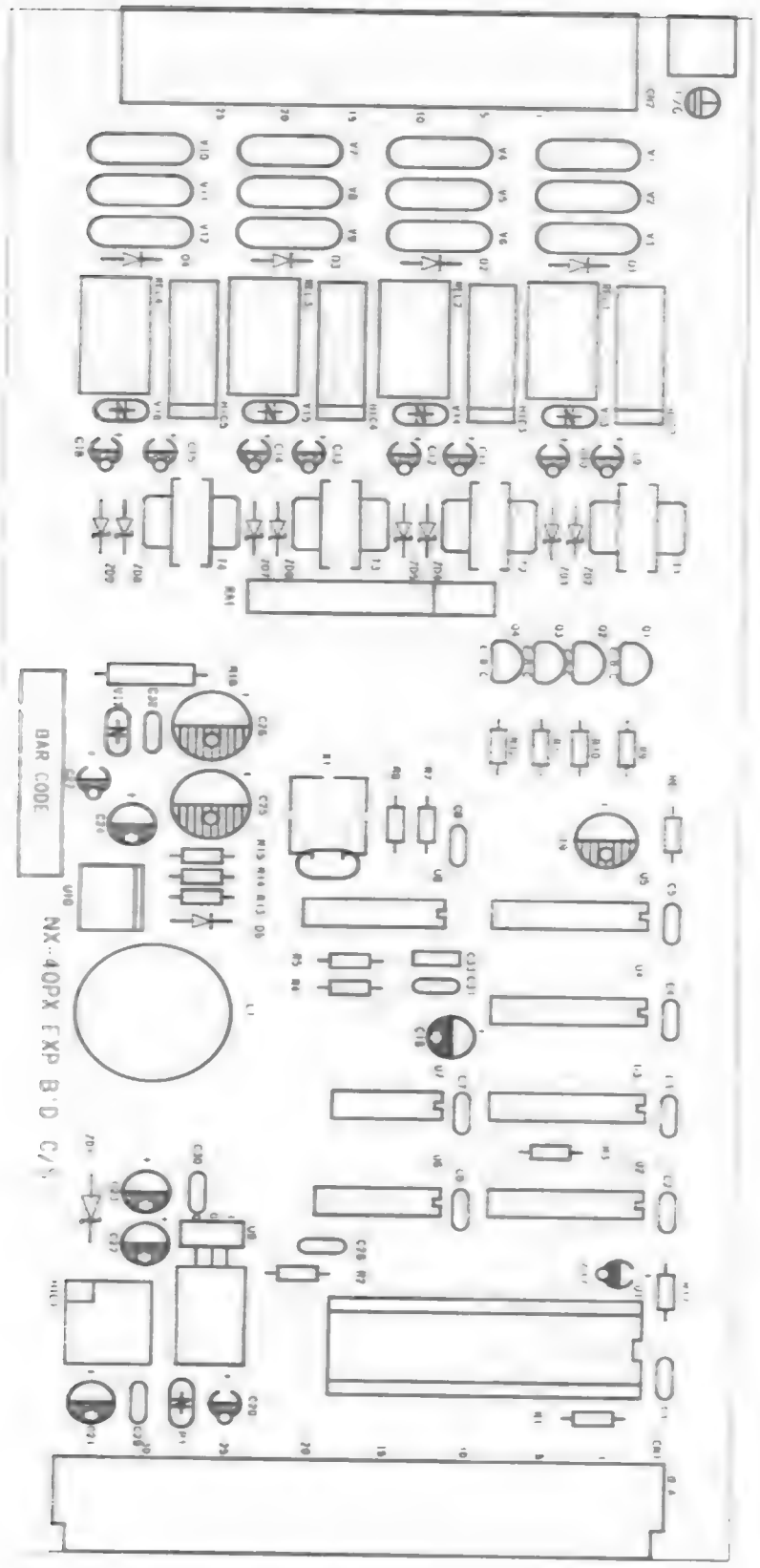
# 4.7 NX-4KLI EXP B'D



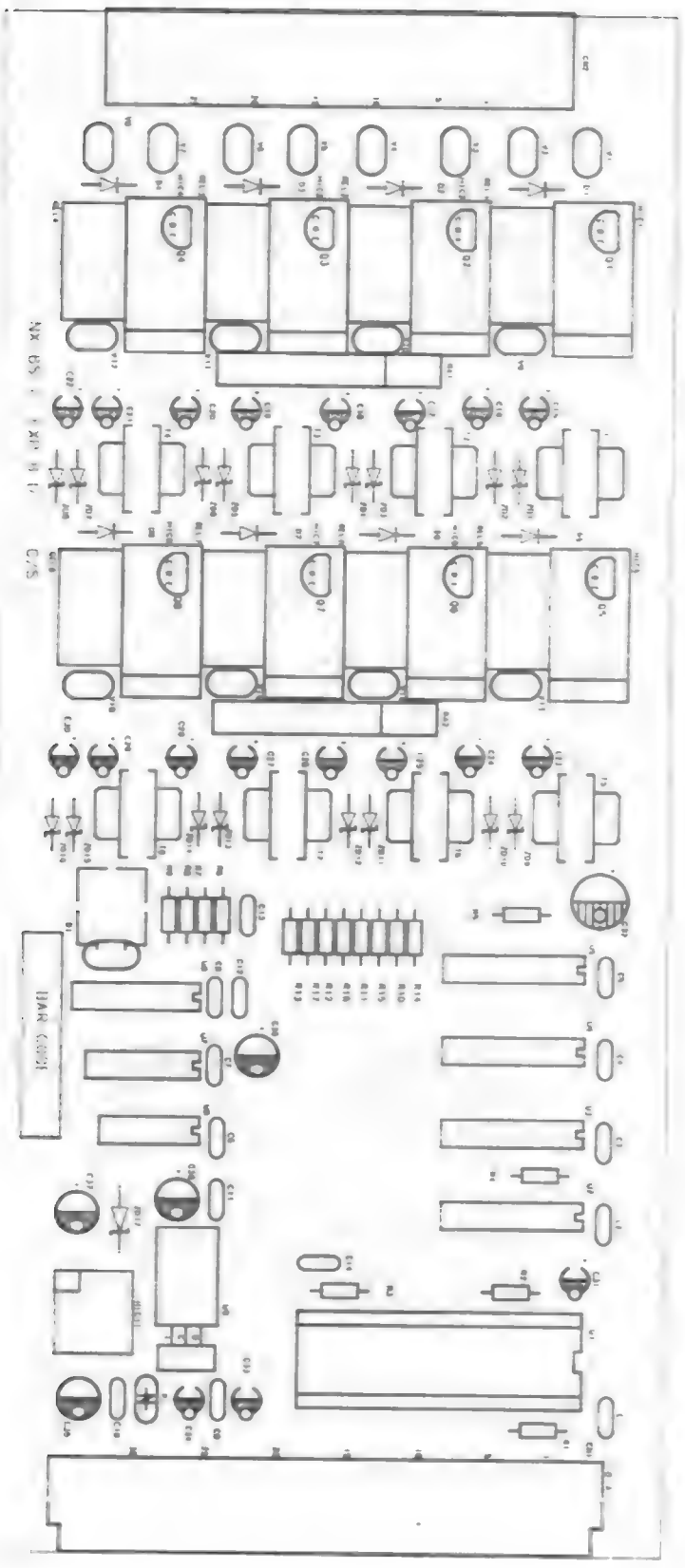
# 4.8 NX-2TRK/4TRK B'D



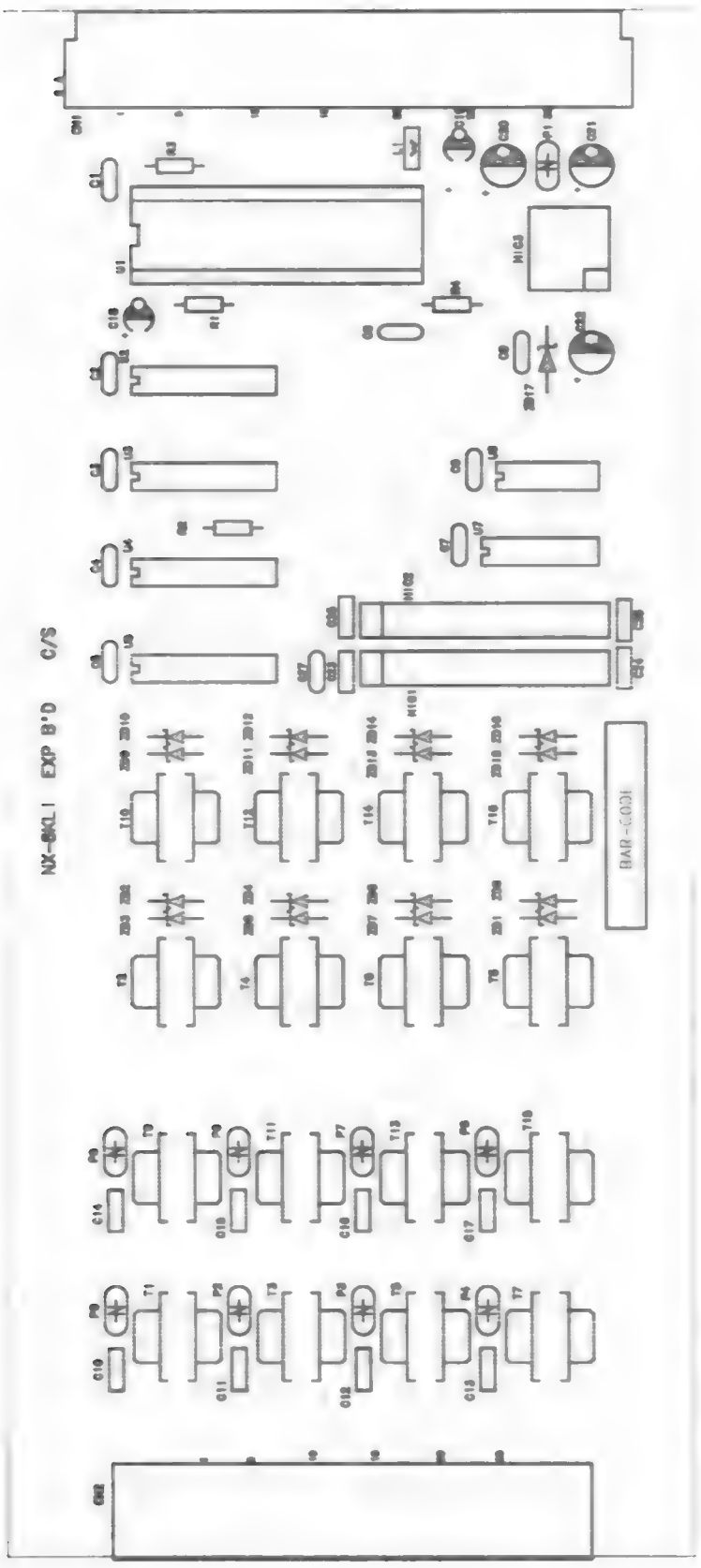
# 4.9 NX-4OPX B'D



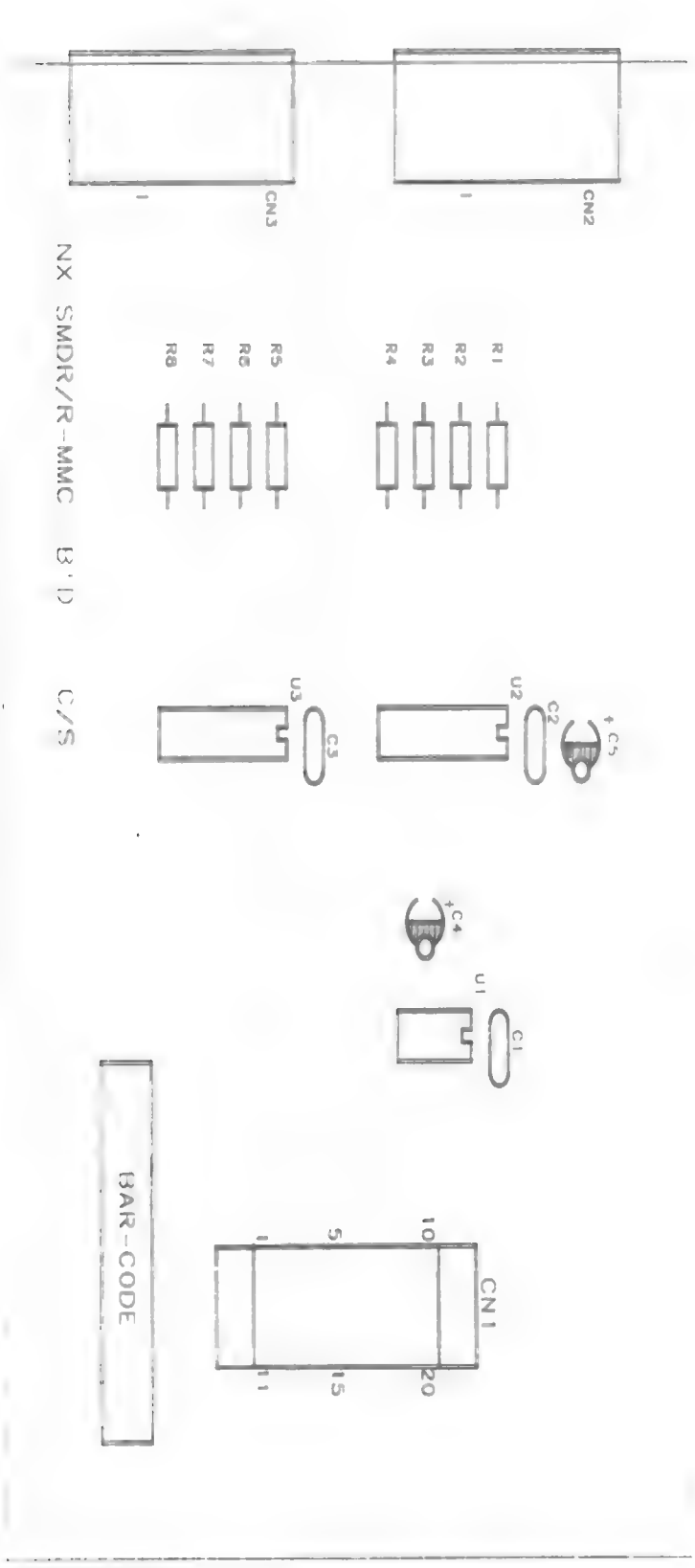
# 4.10 NX-8SLI EXP B'D



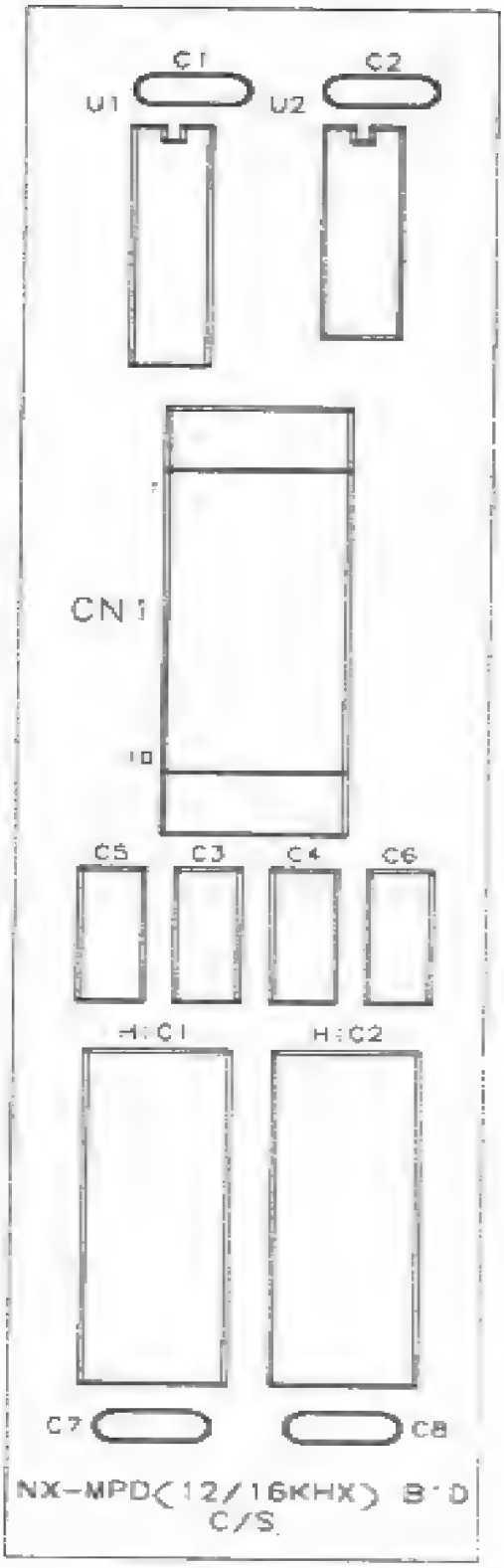
# 4.11 NX-8KLI EXP B'D



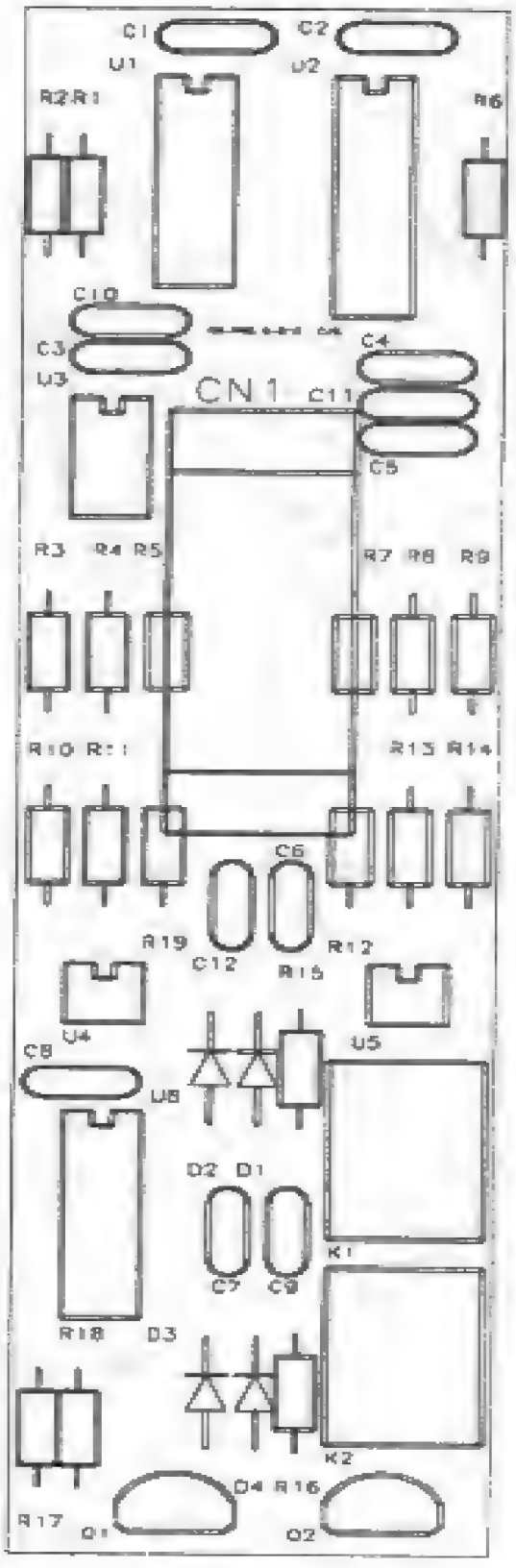
# 4.12 NX-SMDR / R-MMC B'D



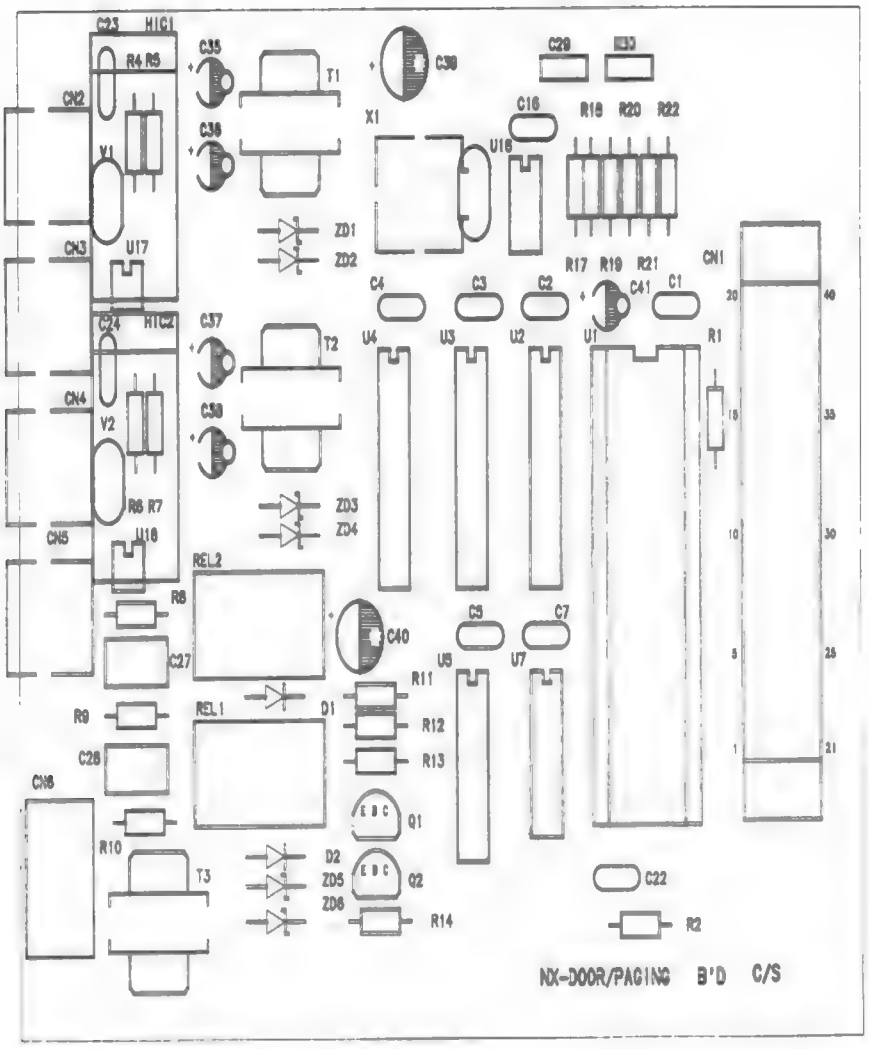
# 4.13 NX-MPD B'D



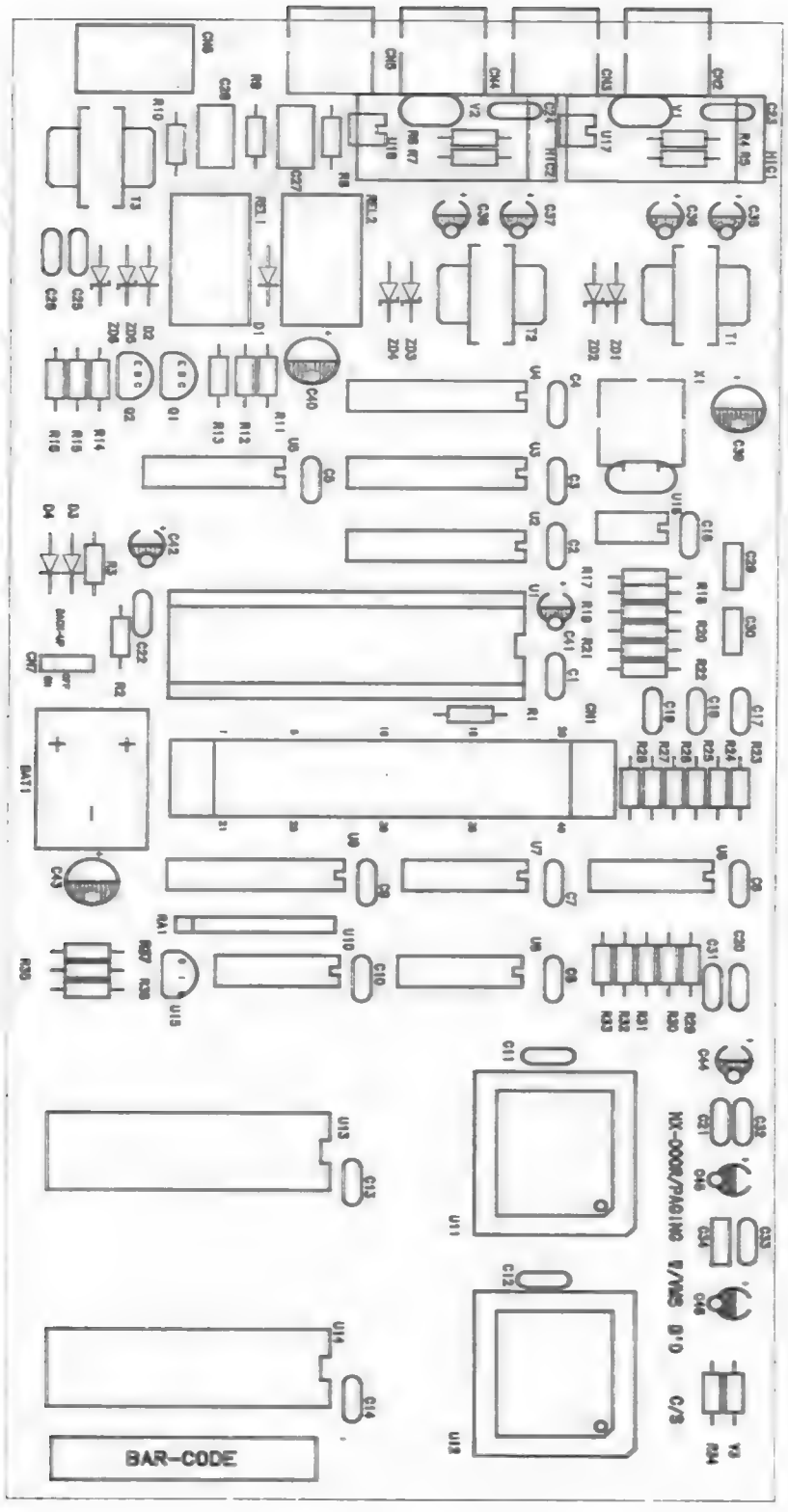
# 4.14 NX-PRS D-B'D



# 4.15 NX-DOOR/PAGING D-B'D



# 4.16 NX-DOOR/PAGING W/VMS D-B'D



# 6.CIRCUIT DIAGRAM

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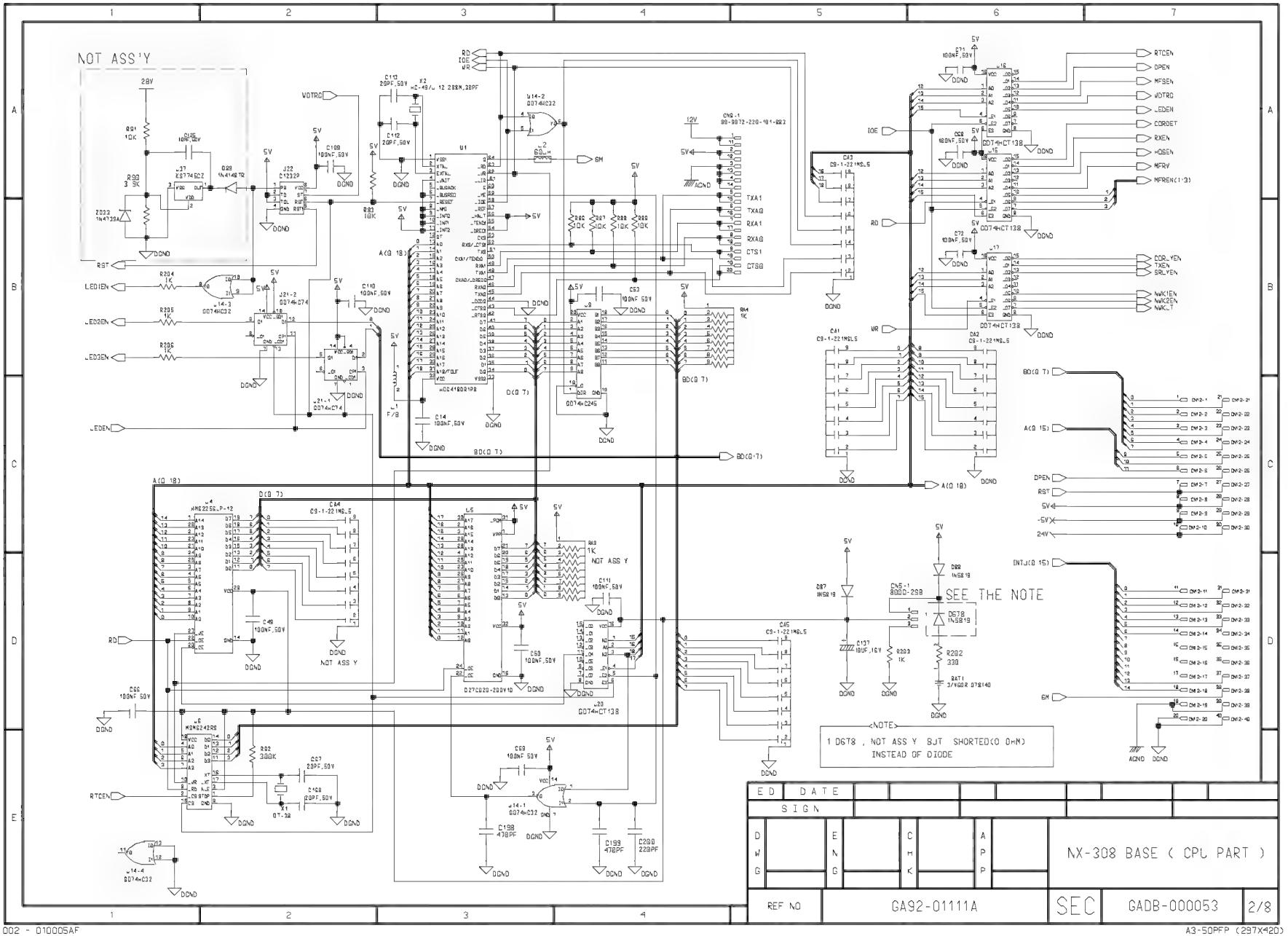

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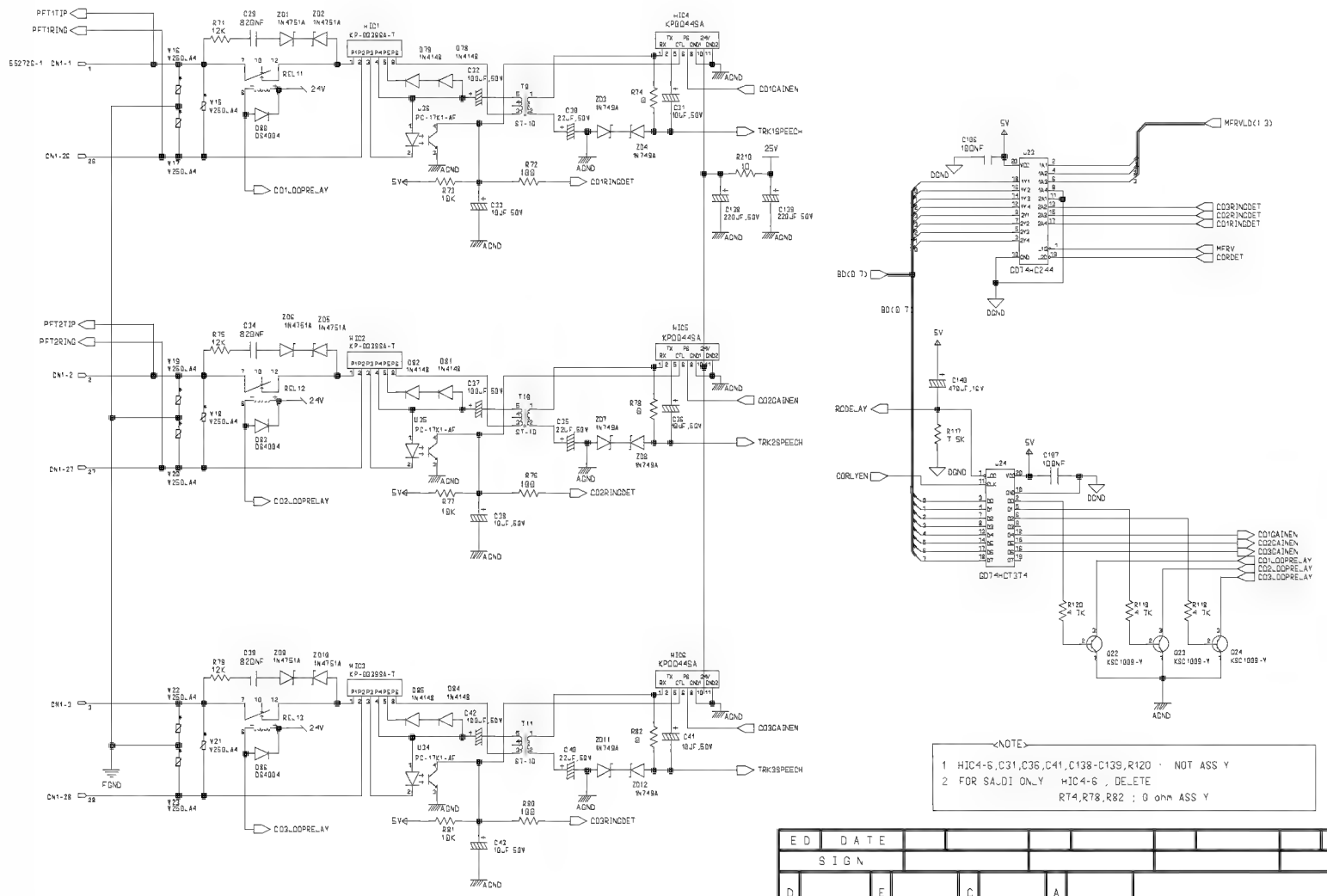


<NOTE>
1 HIC4-5,C31,C36,C41,C138-C139,R120 : NOT ASS'Y
2 FOR SA_DI ON_Y HIC4-6 , DE_ETE
RT4,R78,R82 ; 0 ohm ASS'Y

| ED | DATE | | | | | | | | |
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| SIGN | | | | | | | | | |
| DWG | | ENG | | CHK | | APP | NX - 308 BASE ( CO PART ) | | |
| REF NO | GA92-01111A | | | | | | SEC | GADB-000053 | 3/8 |

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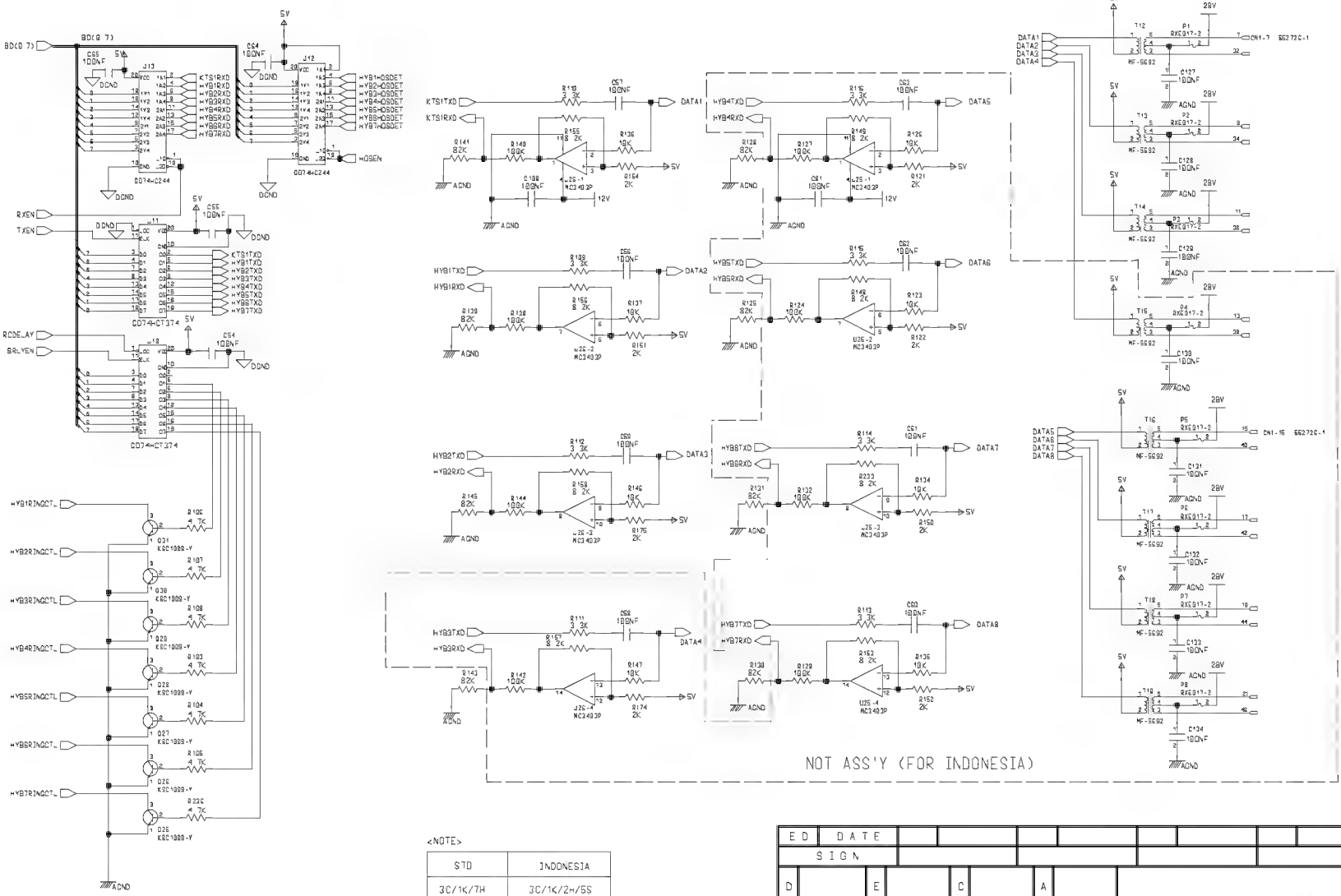

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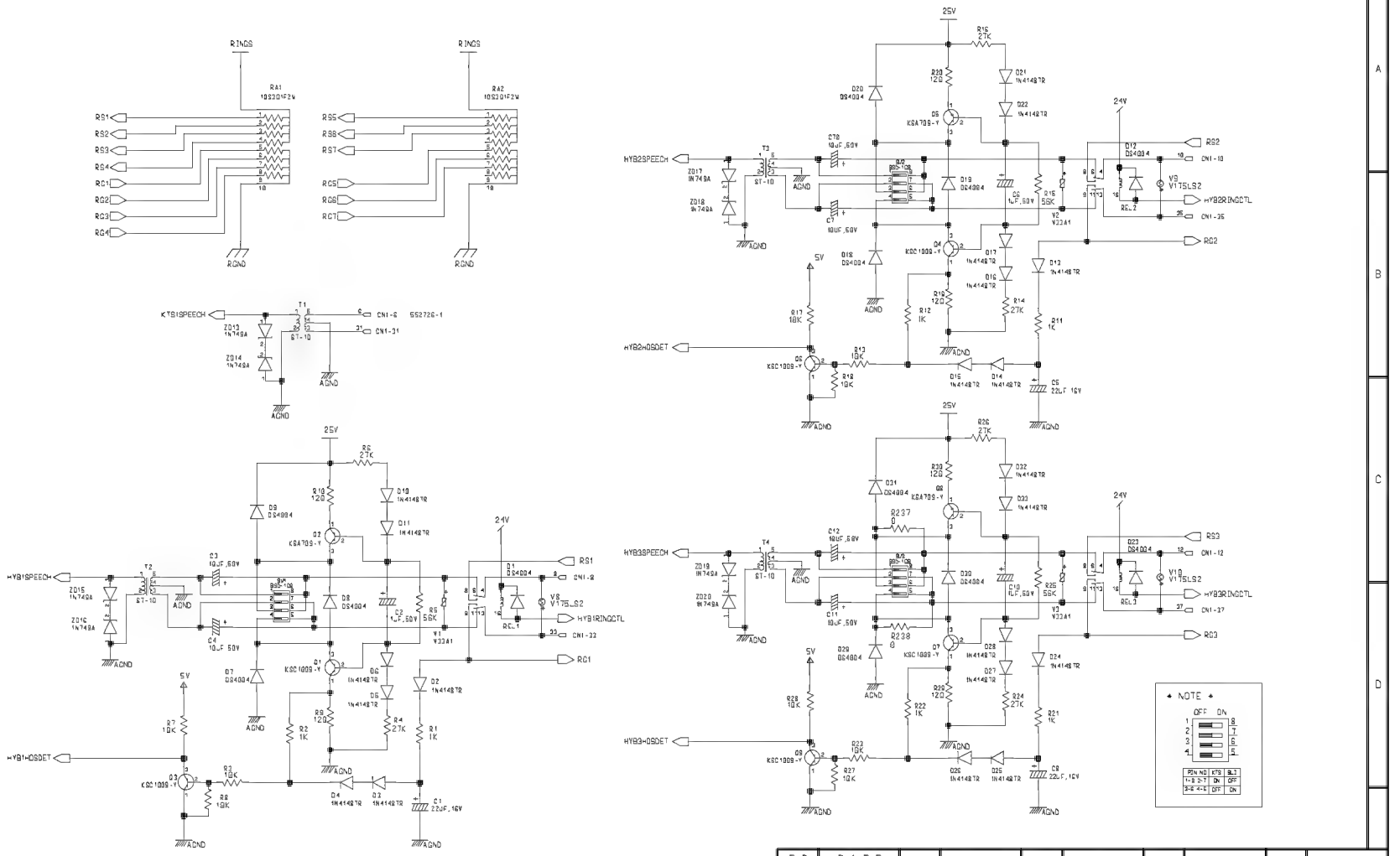

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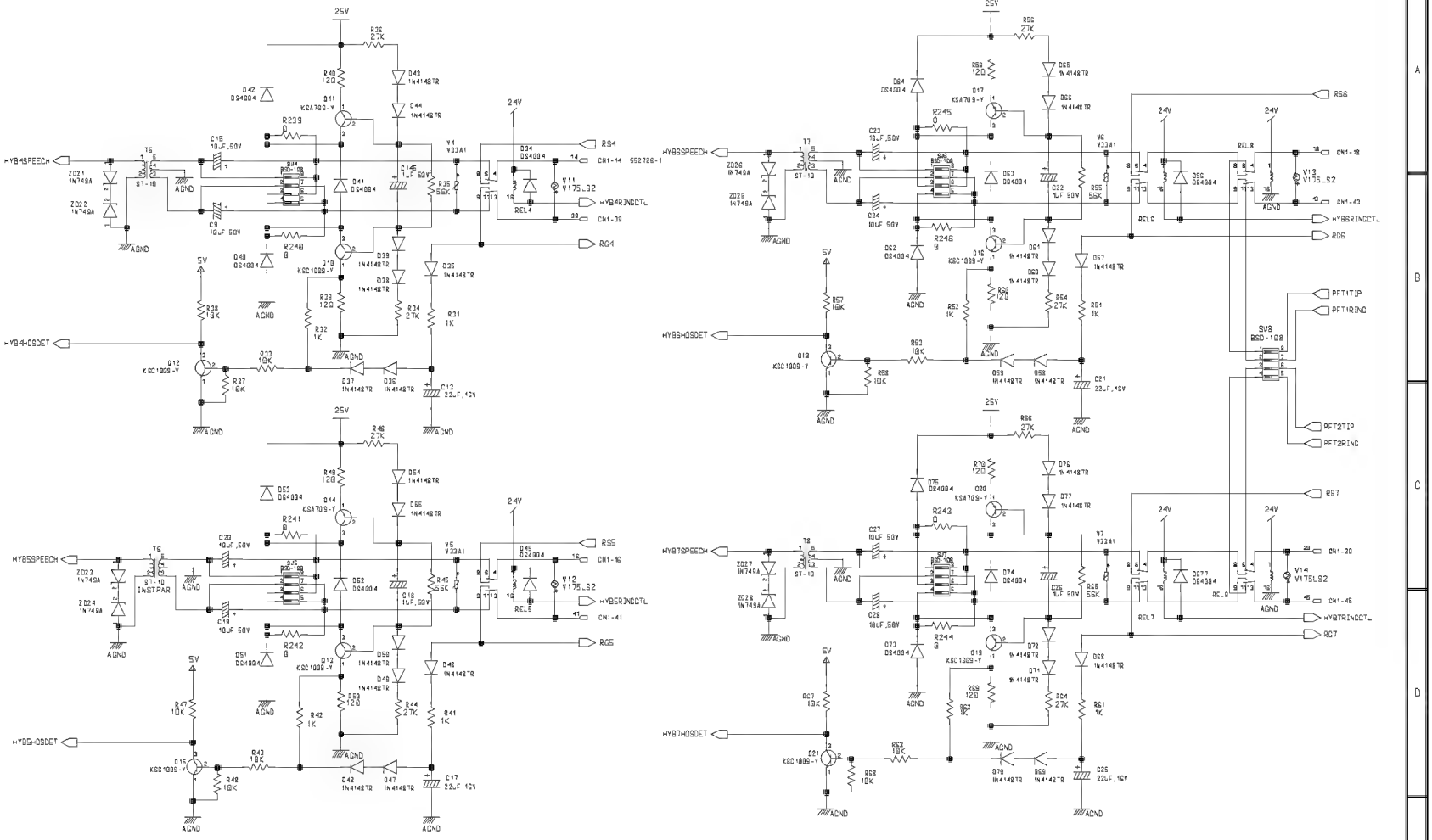


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| ED | DATE | | | | | | | | |
| | SIGN | | | | | | | | |
| DWG | | ENG | | CHK | | APP | NX - 308 BASE ( STN PART ) | | |
| REF NO | GA92-01111A | | | | | | SEC | GADB-000053 | 6/8 |

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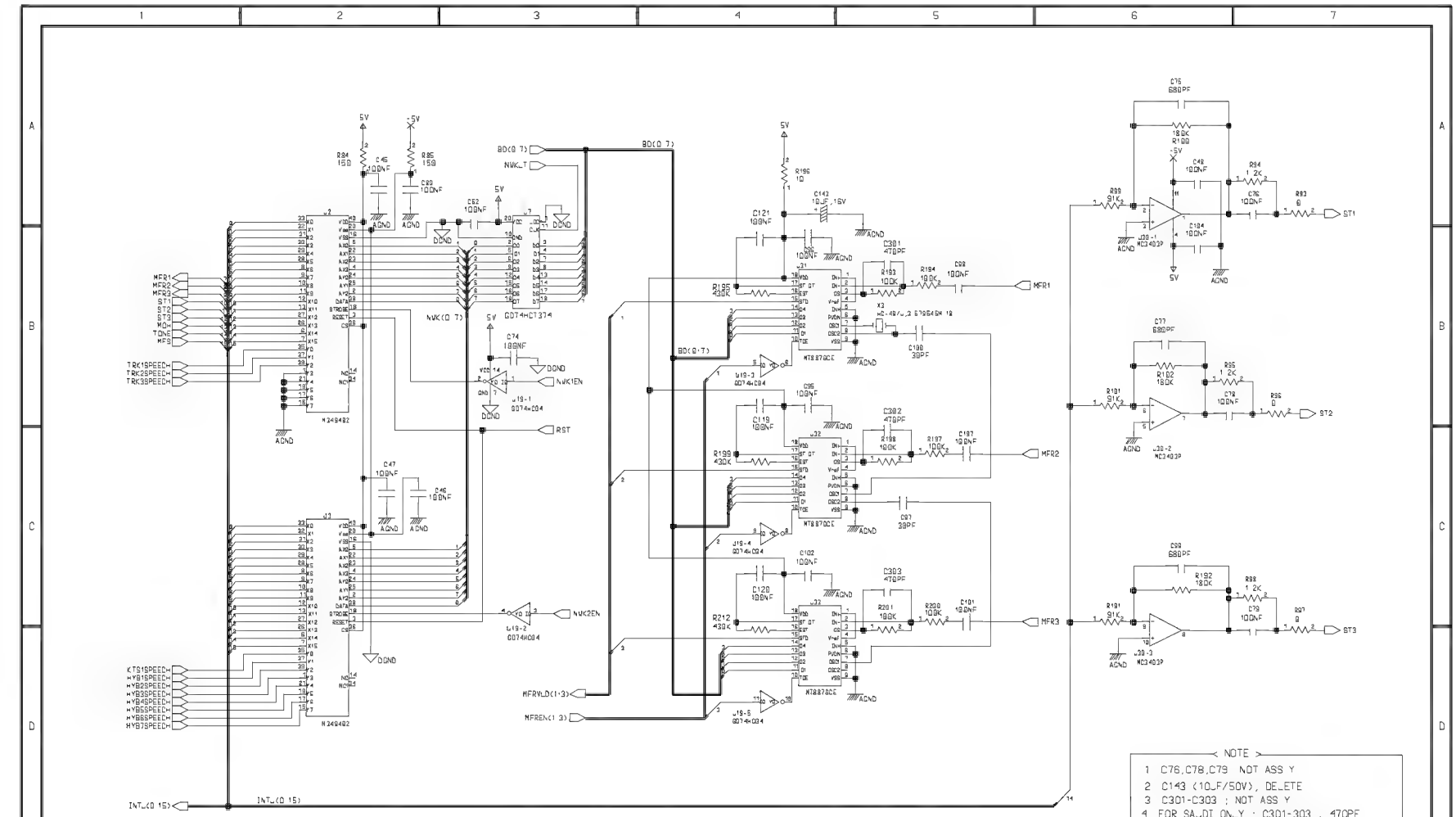


| ED | DATE | | | | | | | | |
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| SIGN | | | | | | | | | |

| DWG | | ENG | | CHK | | APP | | NX - 308 BASE ( NWK PART ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| REF NO | | GA92-01111A | | | | SEC | GADB-000053 | | 7/8 | |

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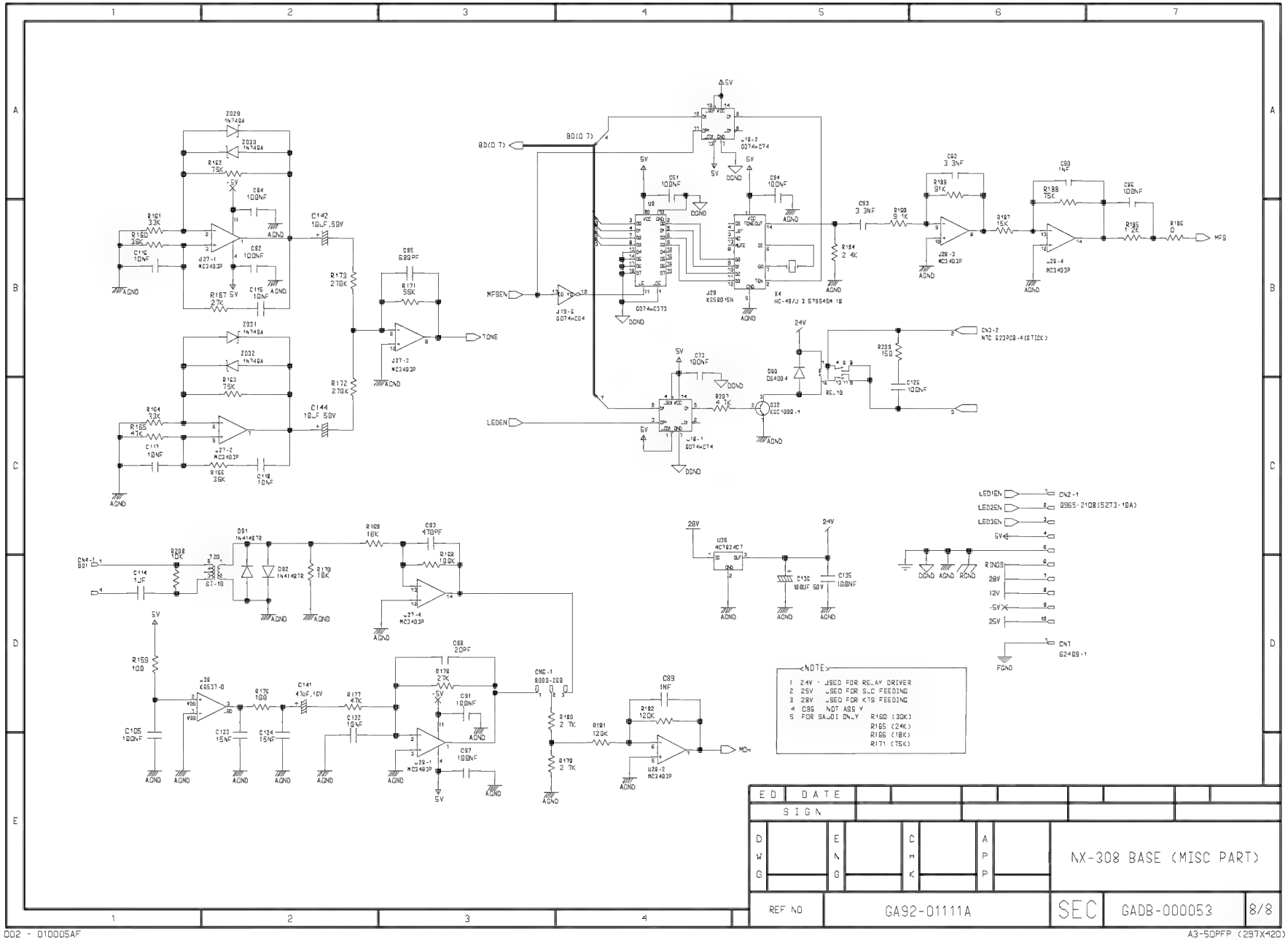

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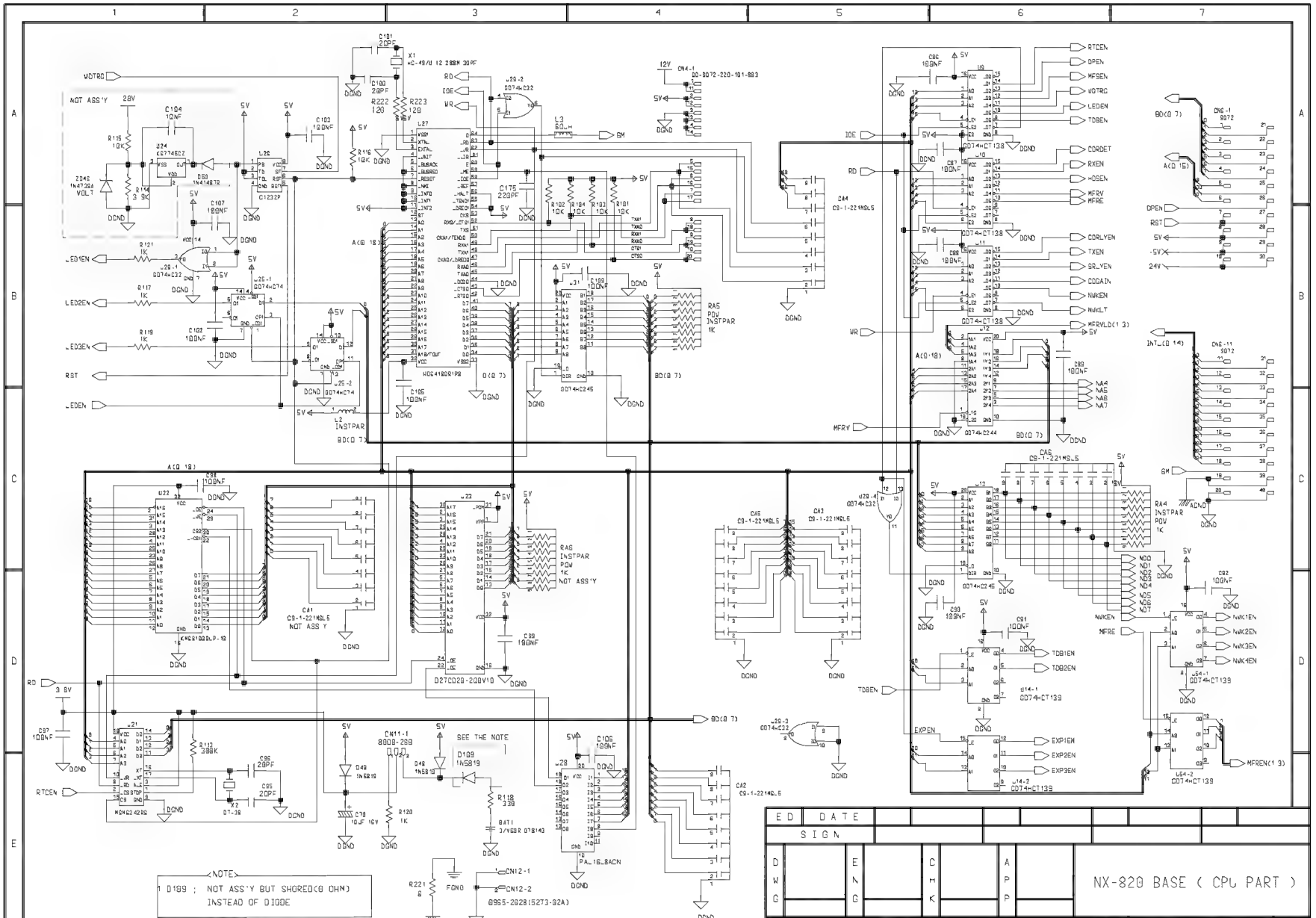

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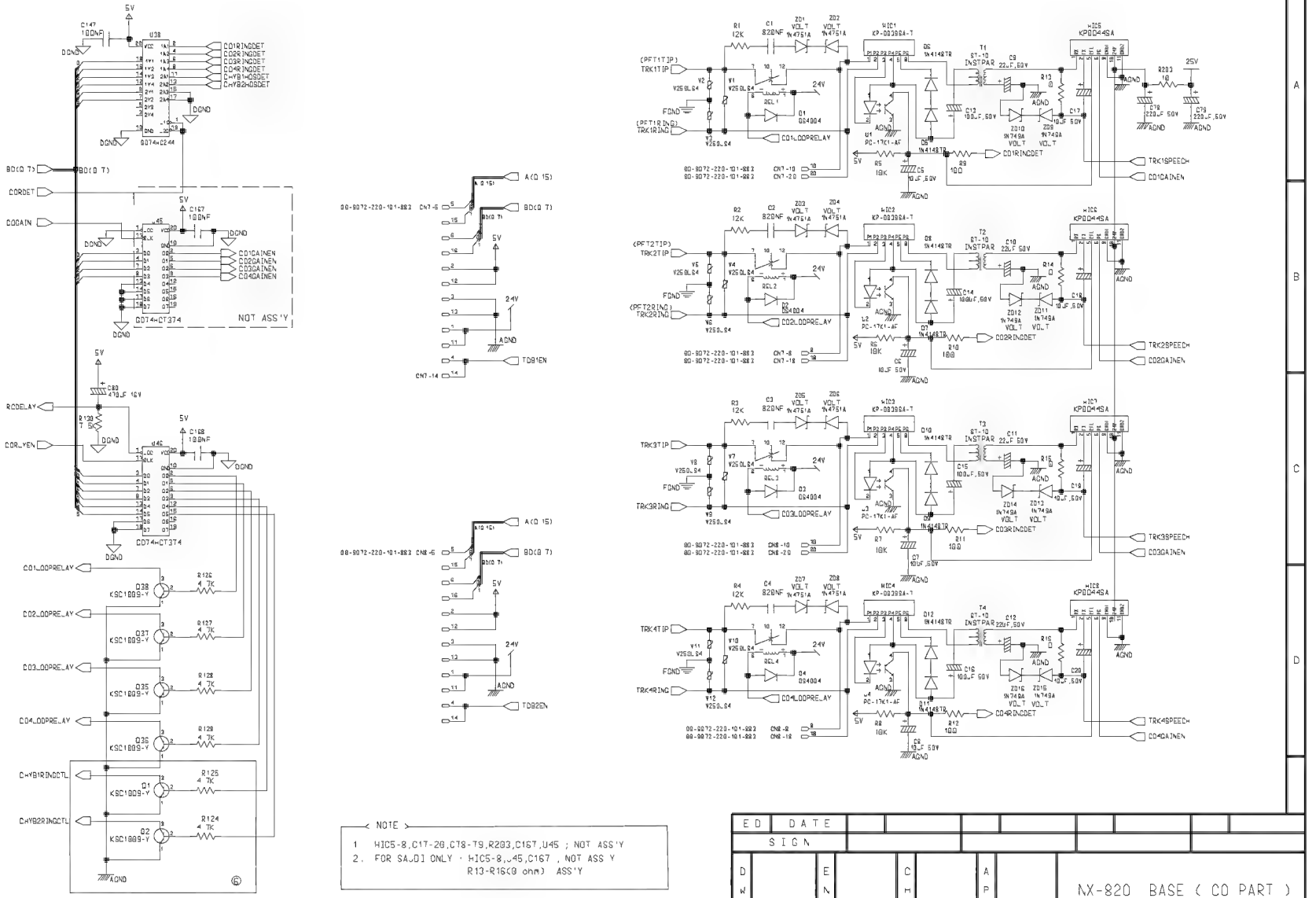

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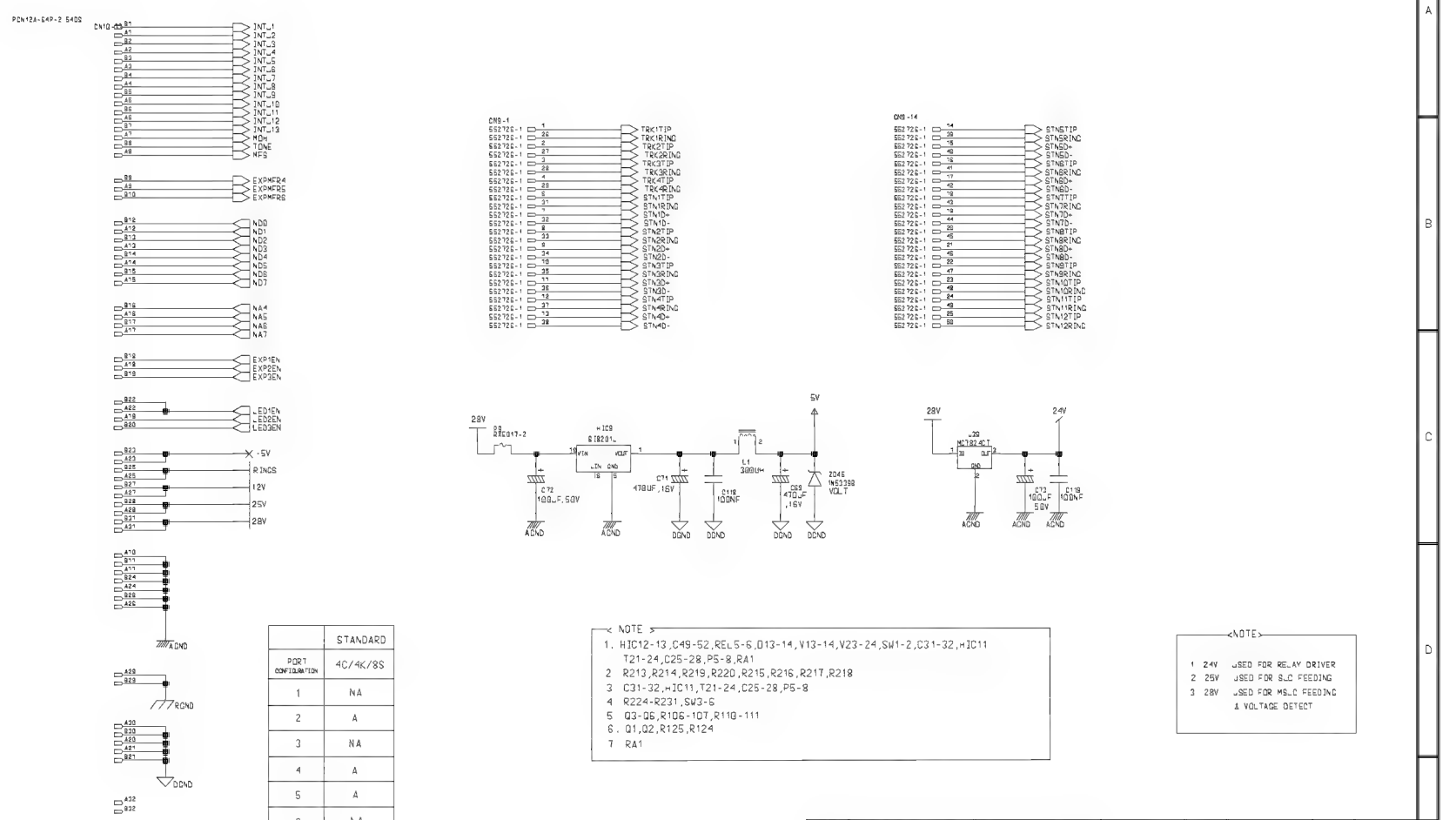


| | STANDARD |
|---|---|
| PORT CONFIGURATION | 4C/4K/8S |
| 1 | NA |
| 2 | A |
| 3 | NA |
| 4 | A |
| 5 | A |
| 6 | NA |
| 7 | NA |

* NA NOT ASSY
* A ASSY

< NOTE >

1. HIC12-13,C49-52,REL5-6,D13-14,V13-14,V23-24,SW1-2,C31-32,HIC11 T21-24,C25-28,P5-8,RA1
2. R213,R214,R219,R220,R215,R216,R217,R218
3. C31-32,HIC11,T21-24,C25-28,P5-8
4. R224-R231,SW3-6
5. Q3-Q5,R106-107,R110-111
6. Q1,Q2,R125,R124
7. RA1

< NOTE >

1. 24V USED FOR RELAY DRIVER
2. 25V USED FOR SLIC FEEDING
3. 28V USED FOR MSLIC FEEDING & VOLTAGE DETECT

| ED | DATE | 04 | 98 01 14 | | | | | | |
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| SIGN | | | | | | | | | |

| DWG | | ENG | | CHK | | APP | | NX-820 BASE (CON PART) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| REF NO | GA92-01121A | | | | | | | SEC | GADB-000054 | 4/8 |

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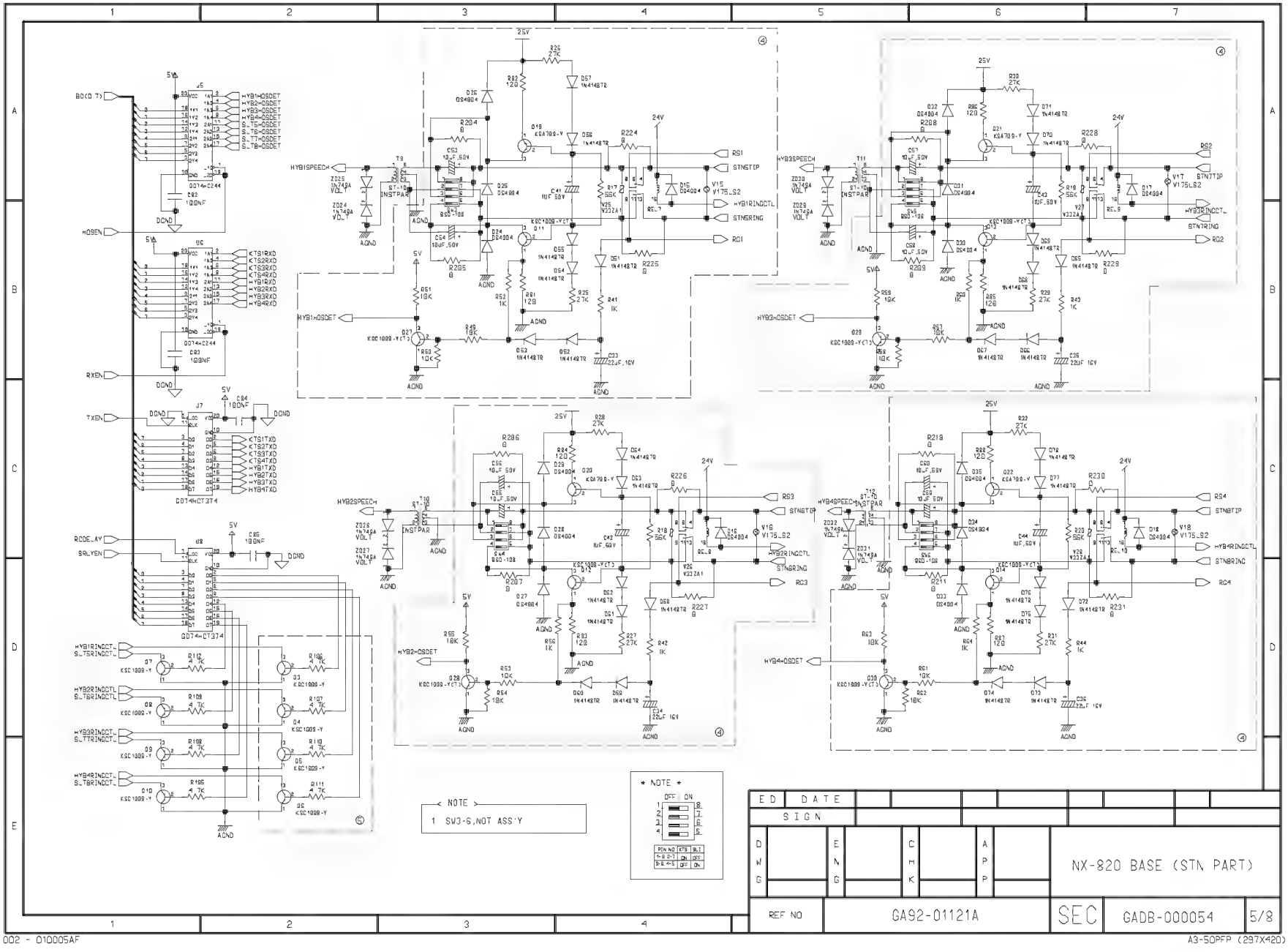

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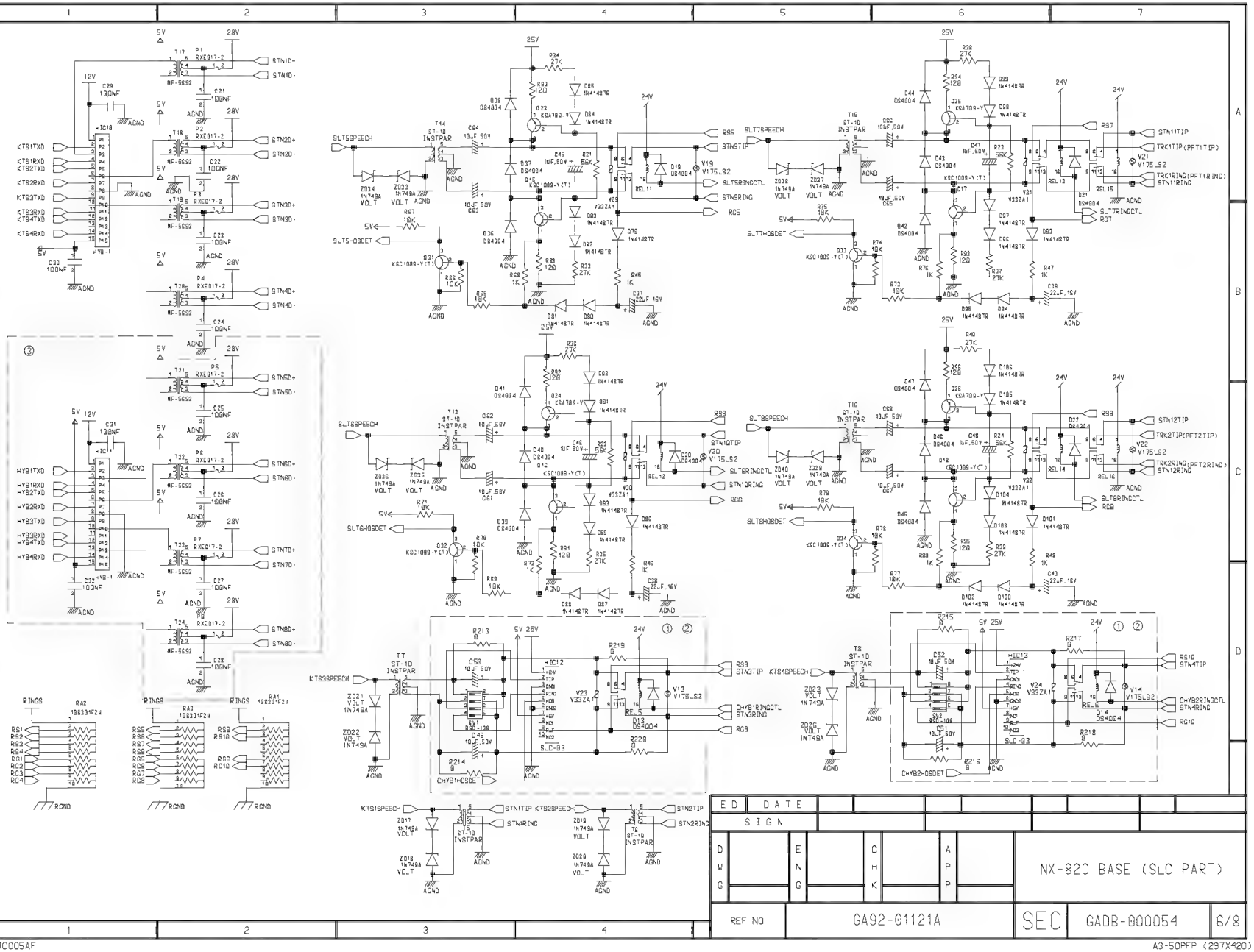

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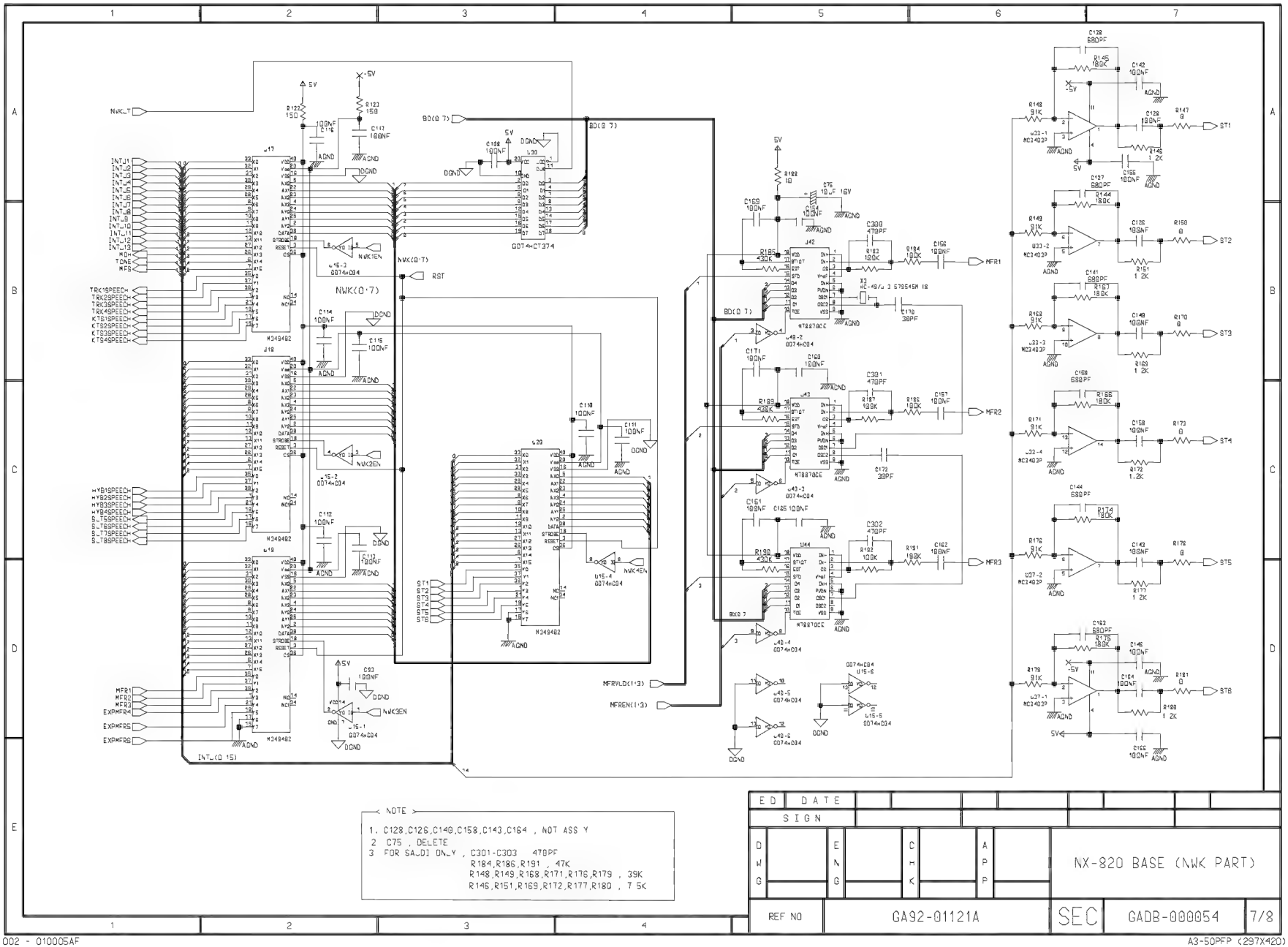

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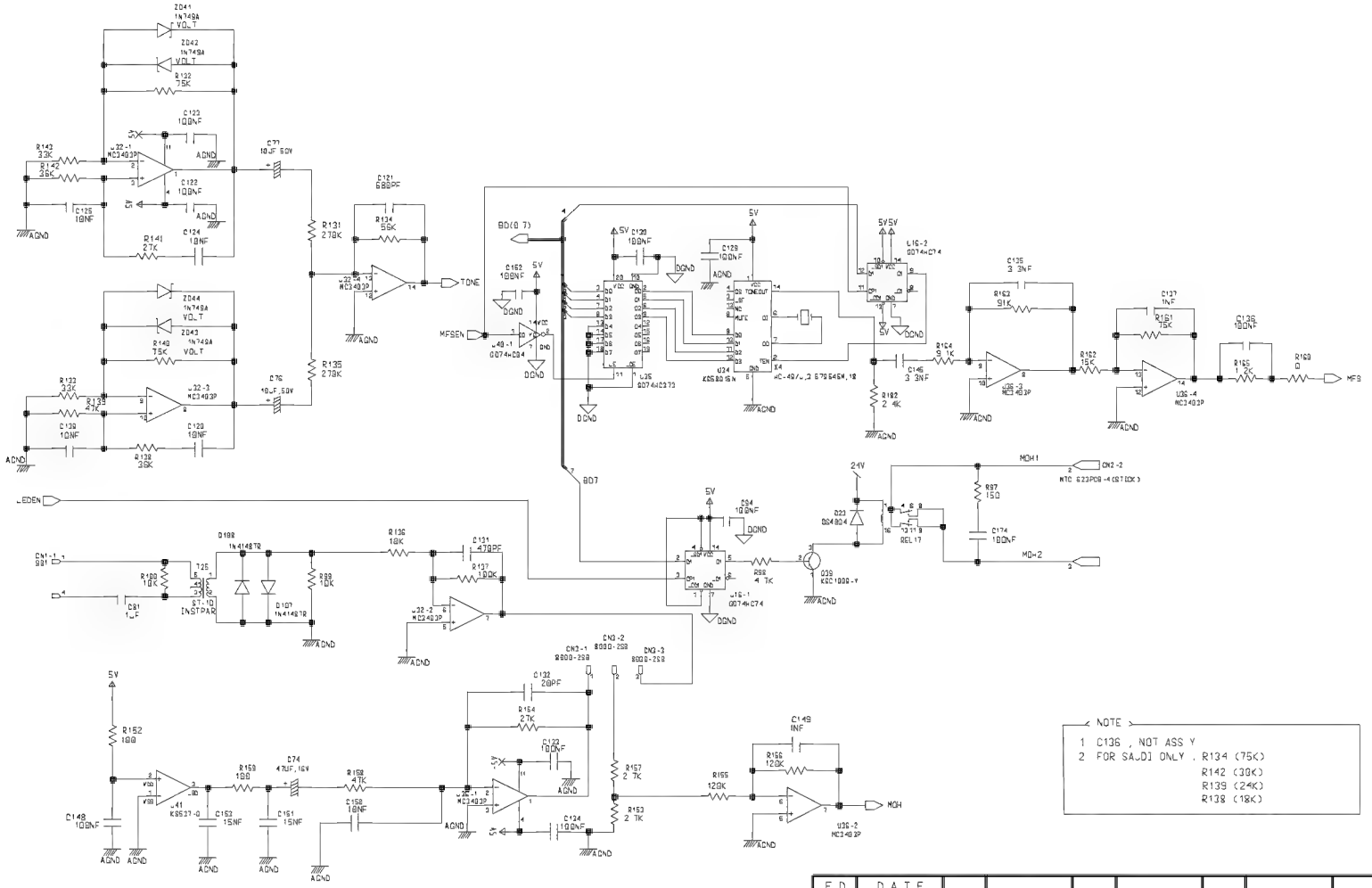

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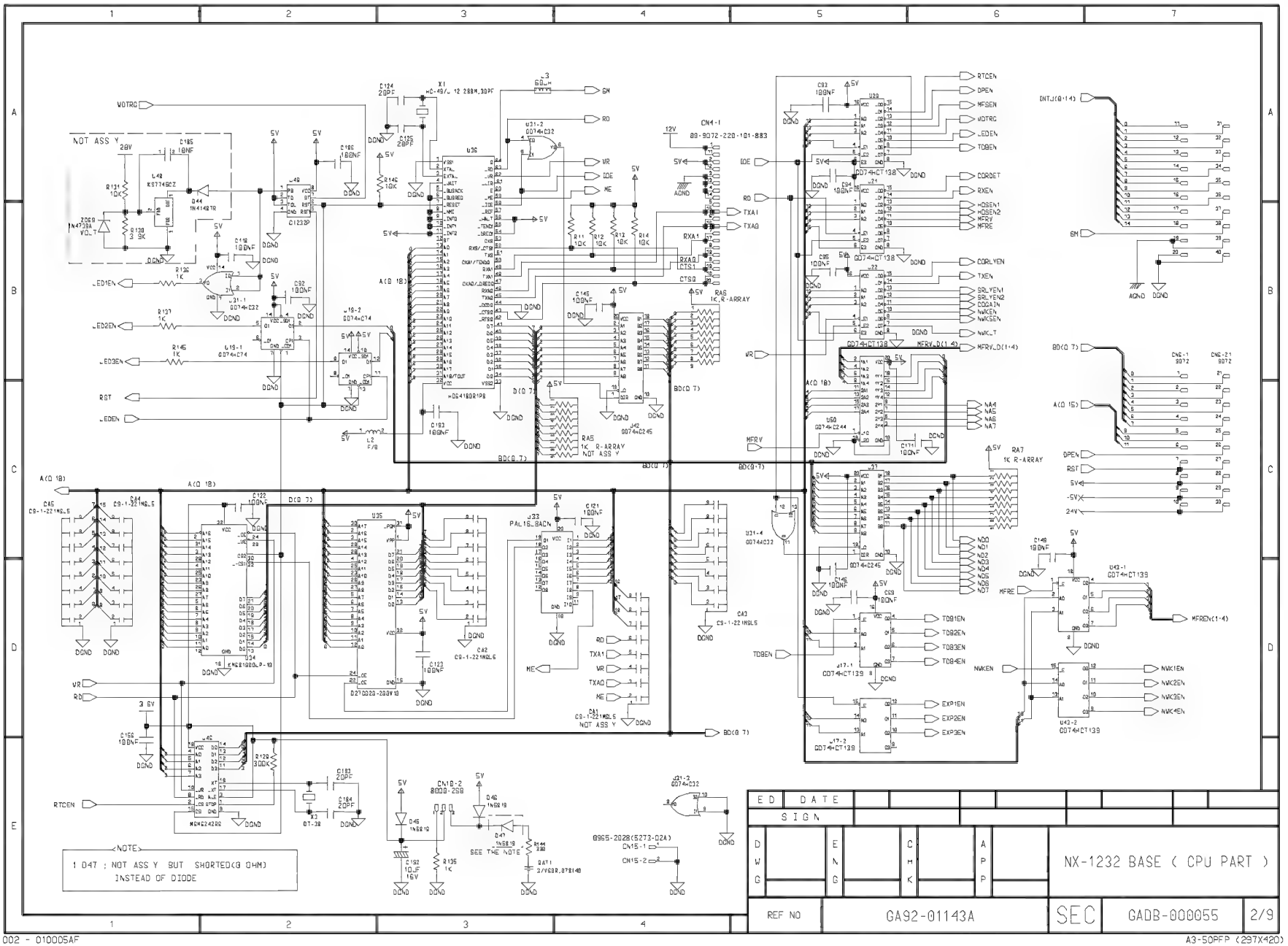

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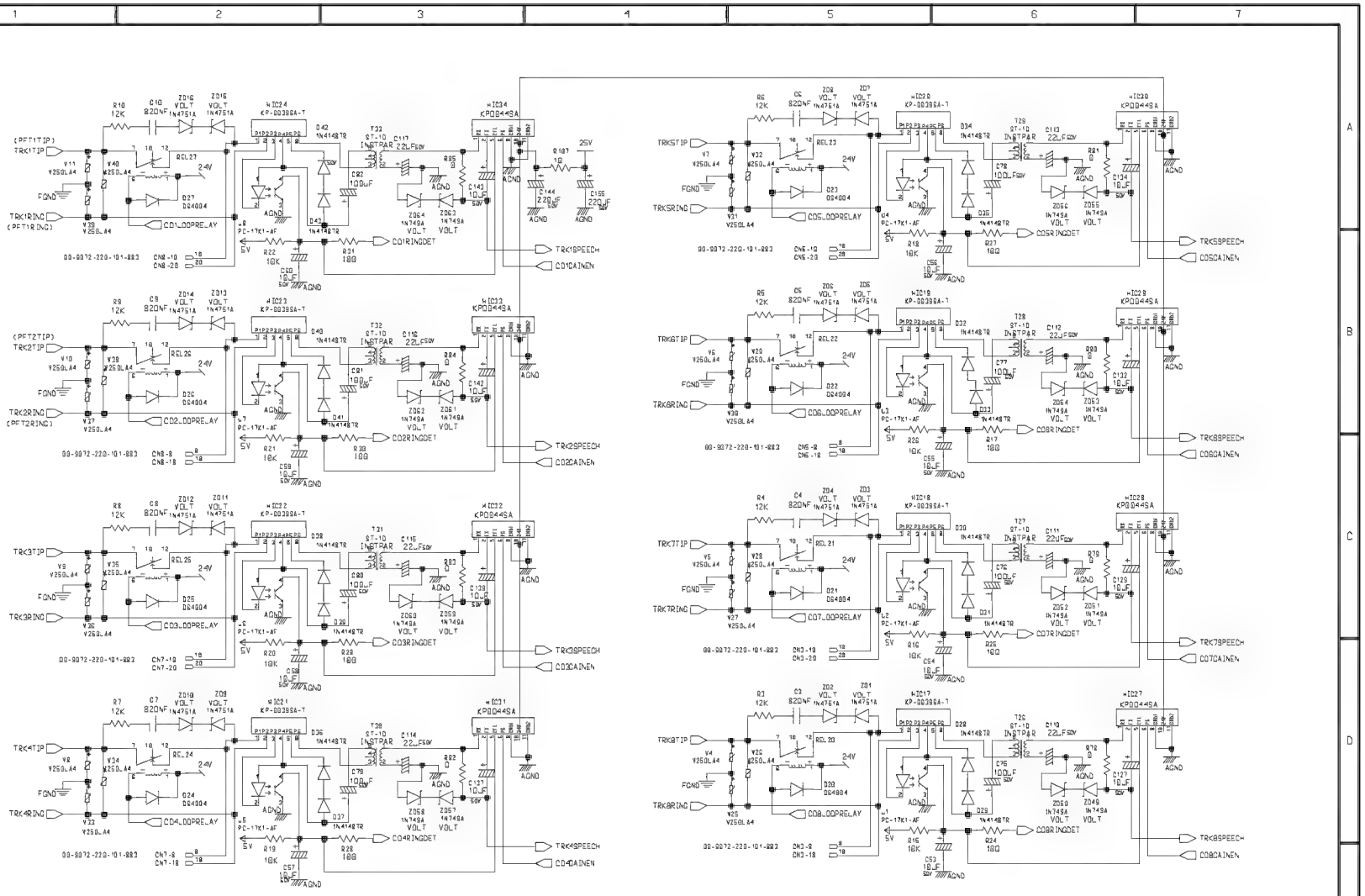

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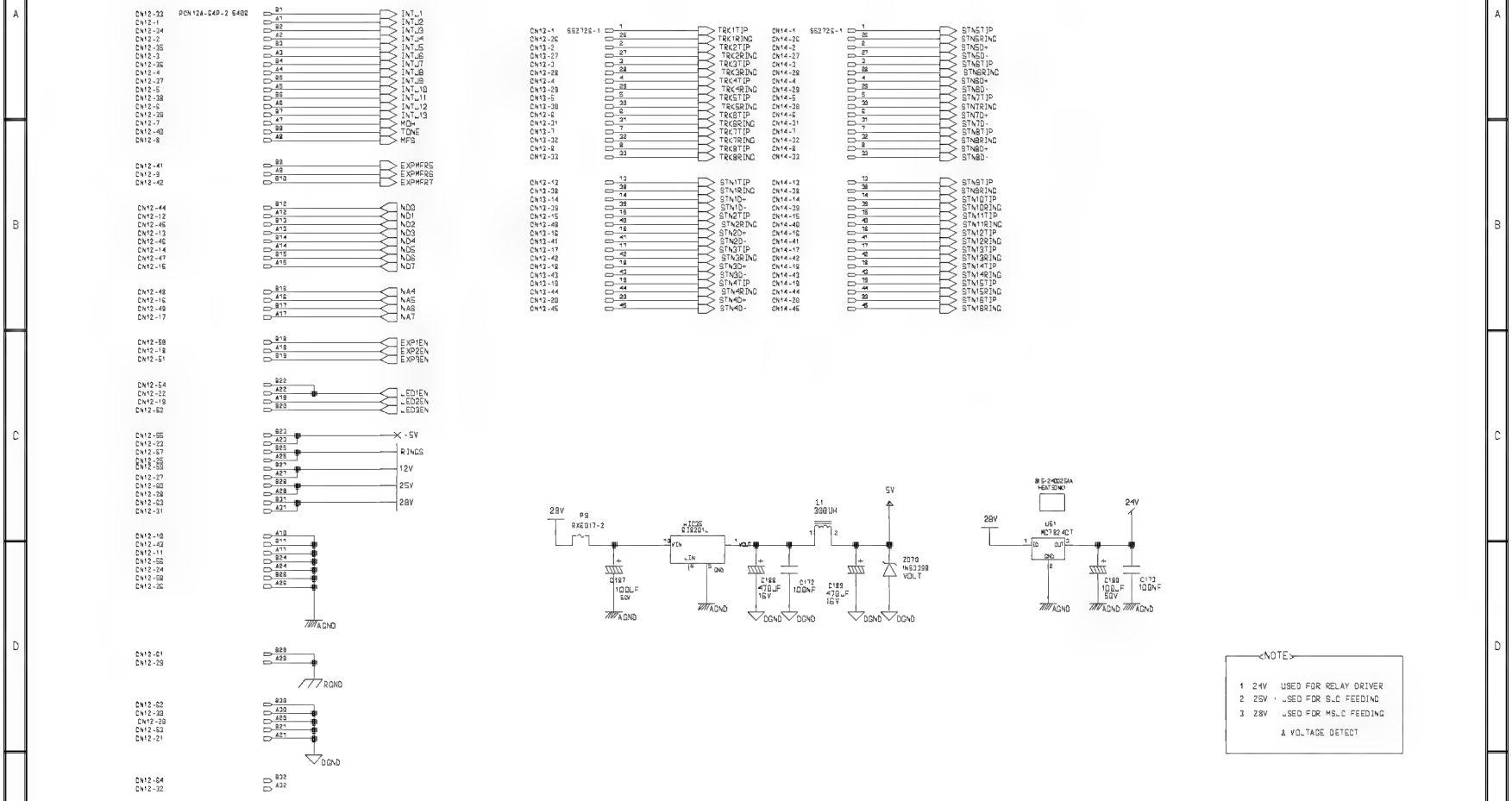


| ED | DATE | | | | | | | | |
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| | SIGN | | | | | | | | |

| DWG | | ENG | | CHK | | APP | | NX-1232 BASE ( CPU PART ) | | |
|---|---|---|---|---|---|---|---|---|---|---|

| REF NO | GA92-01143A | SEC | GADB-000055 | 4/9 |
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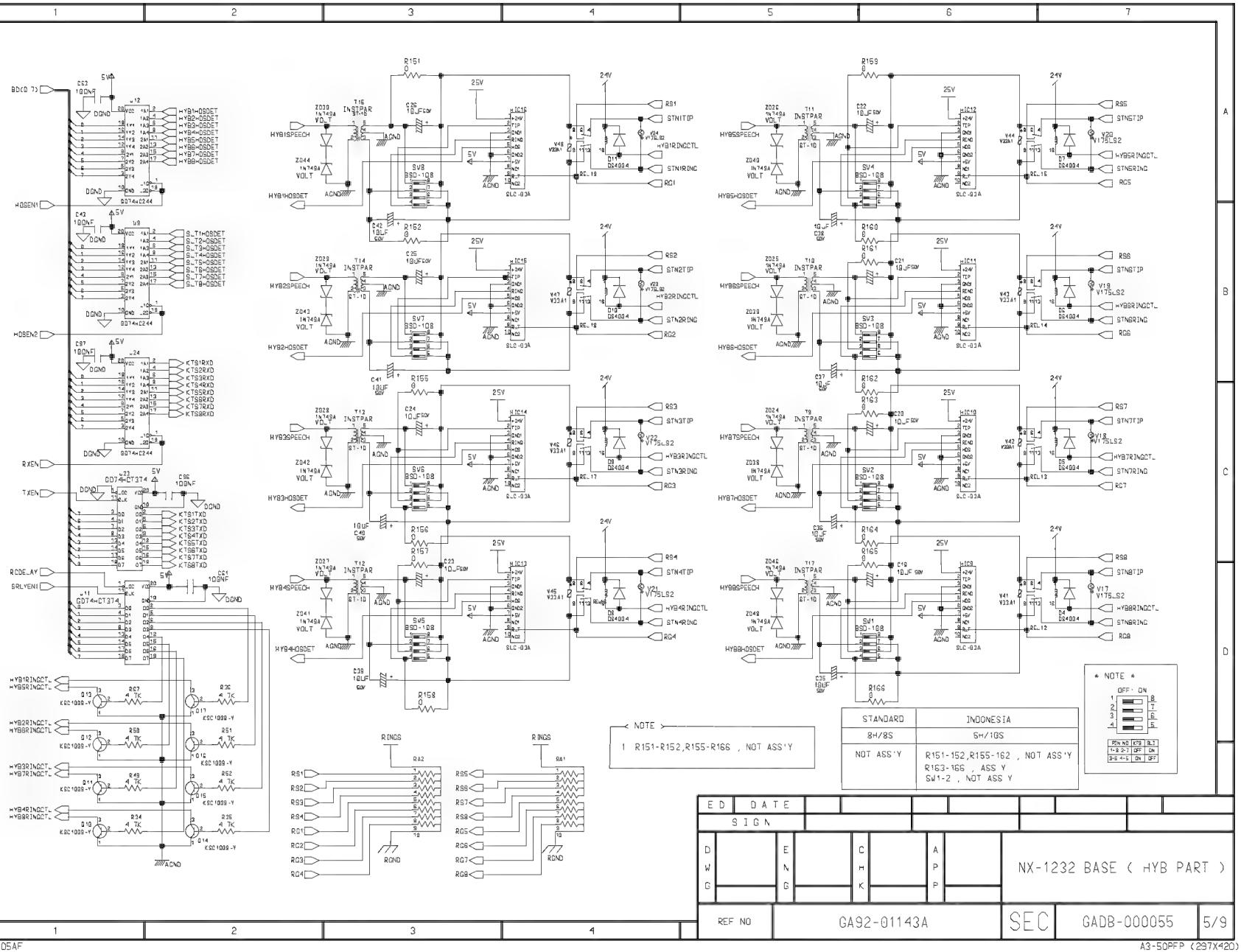

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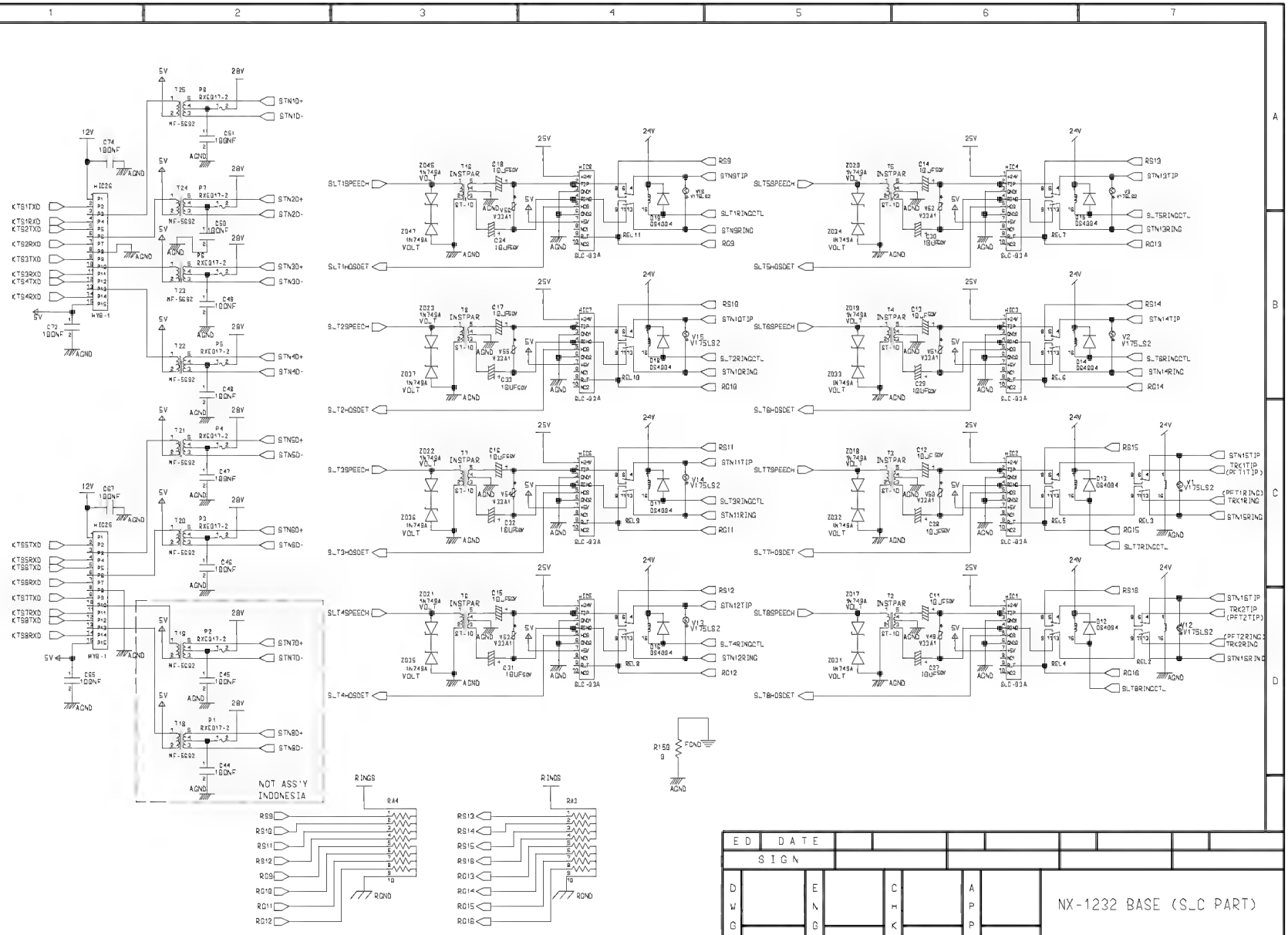

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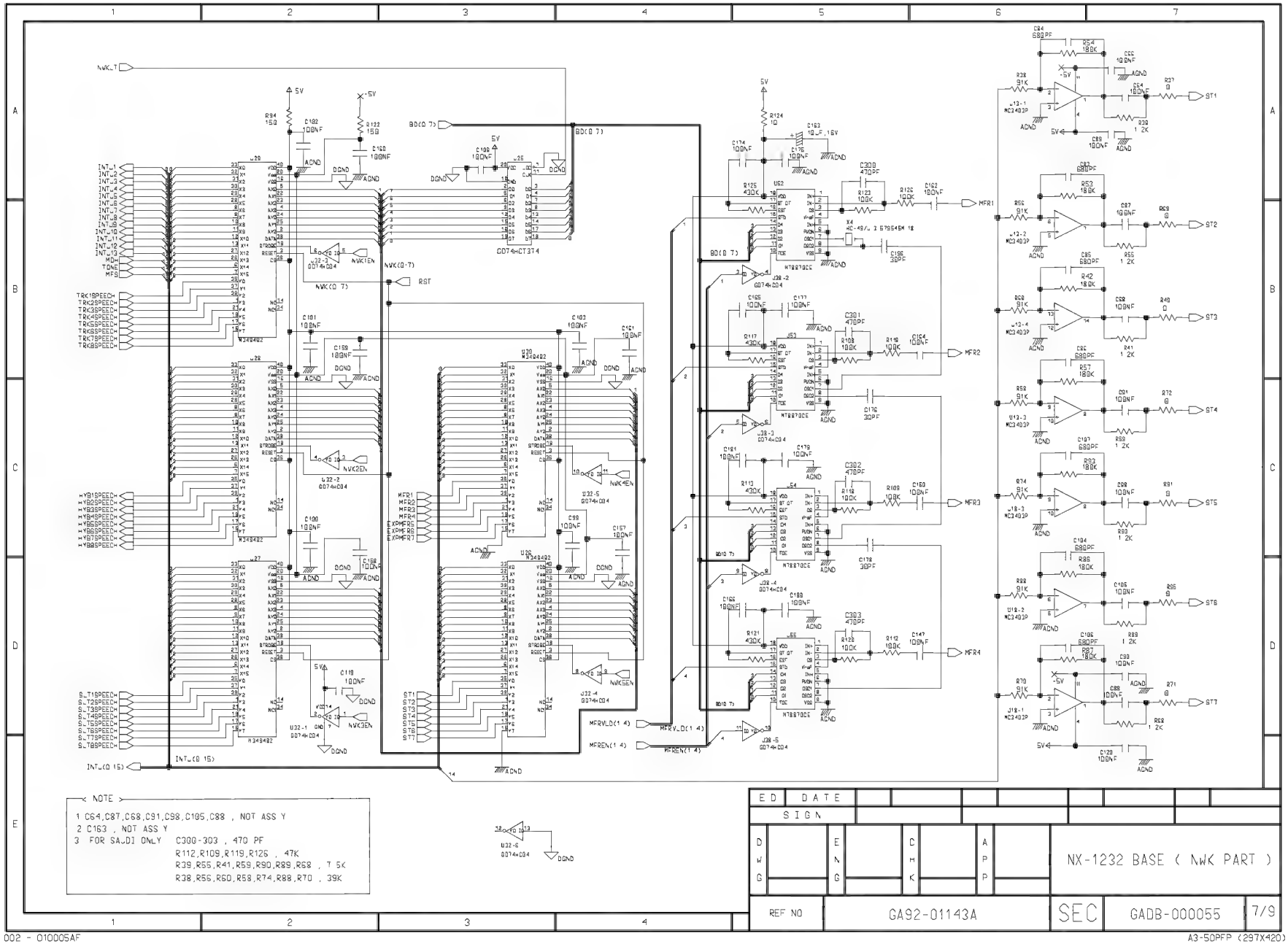

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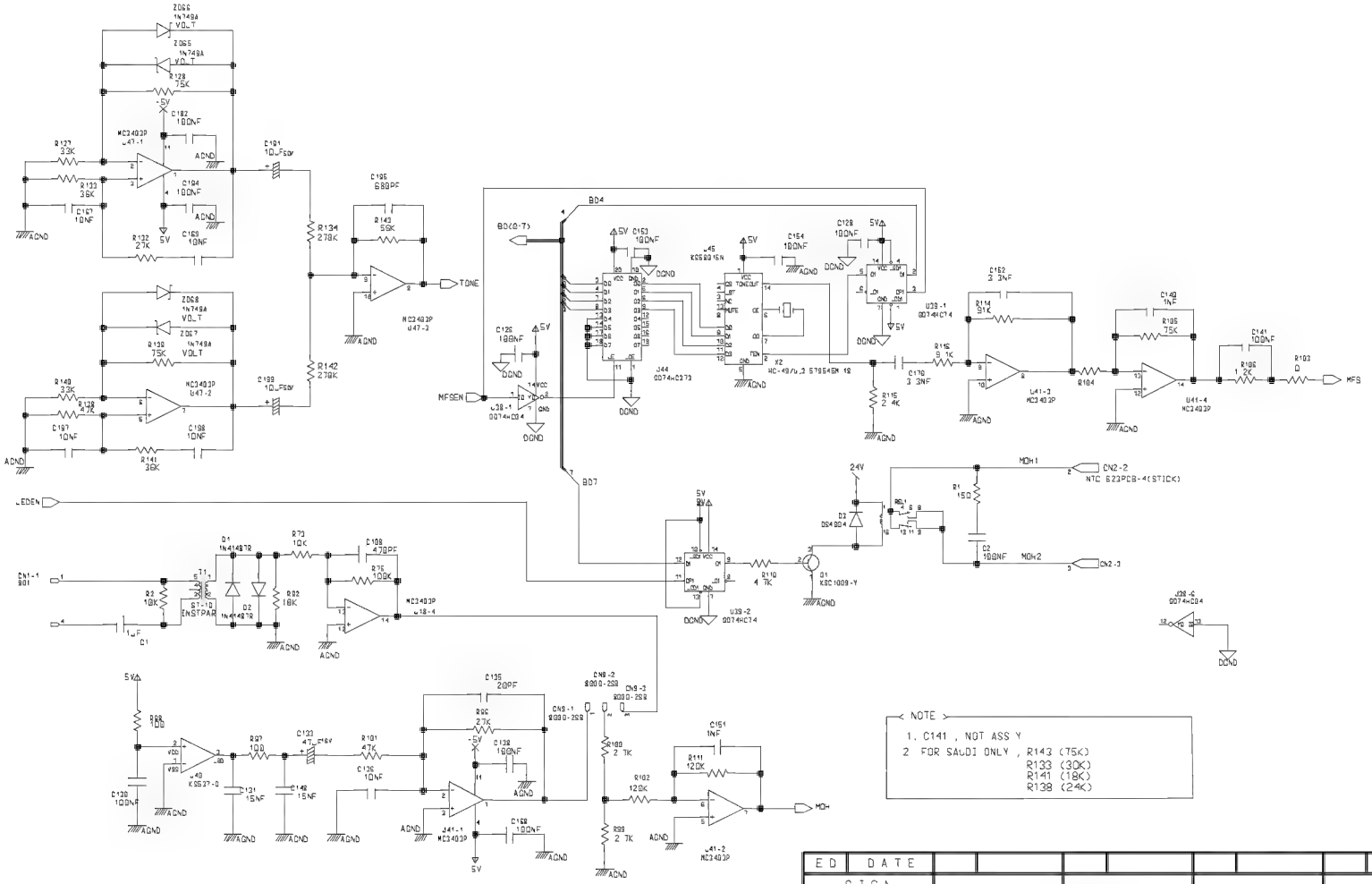

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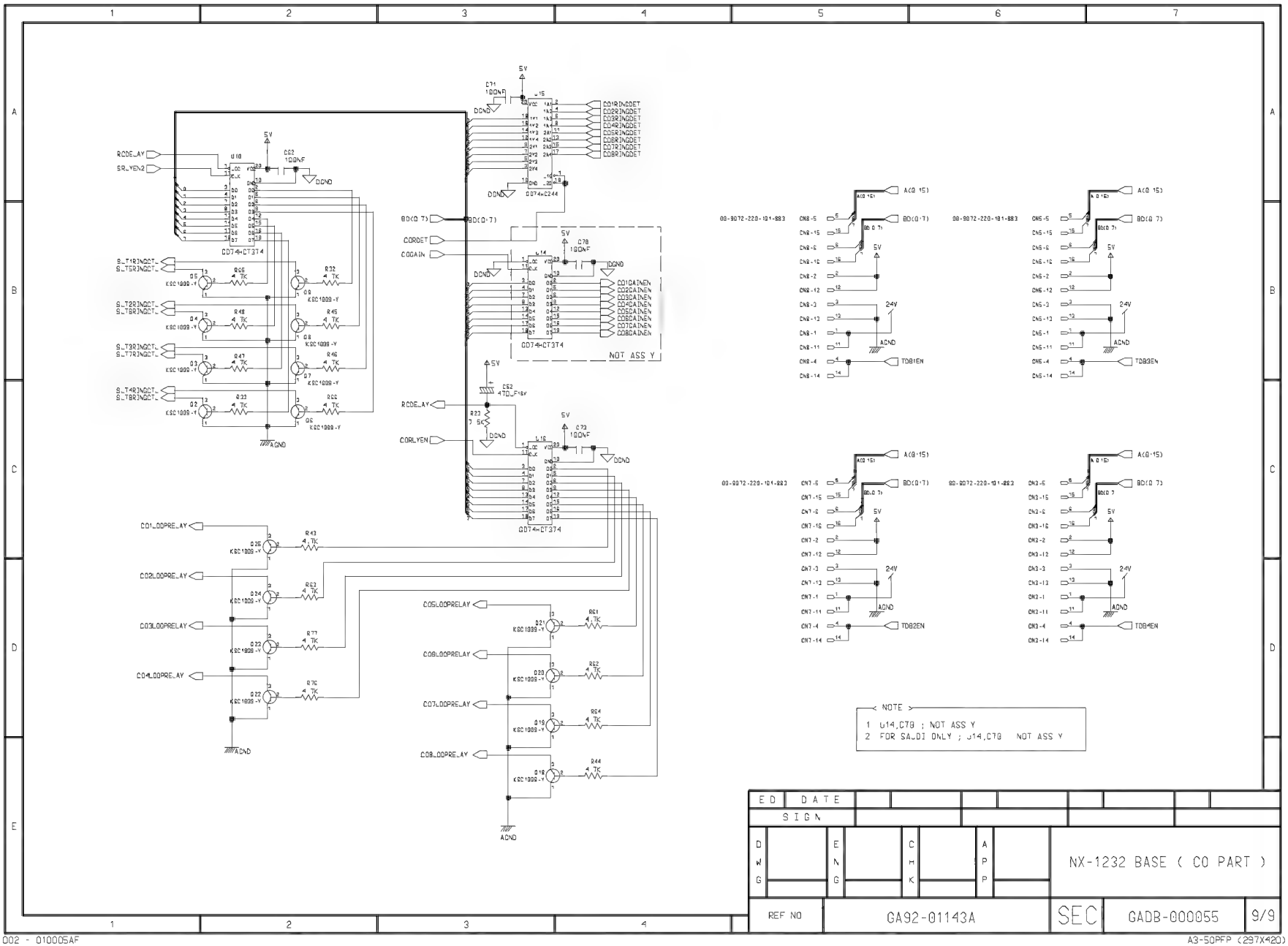

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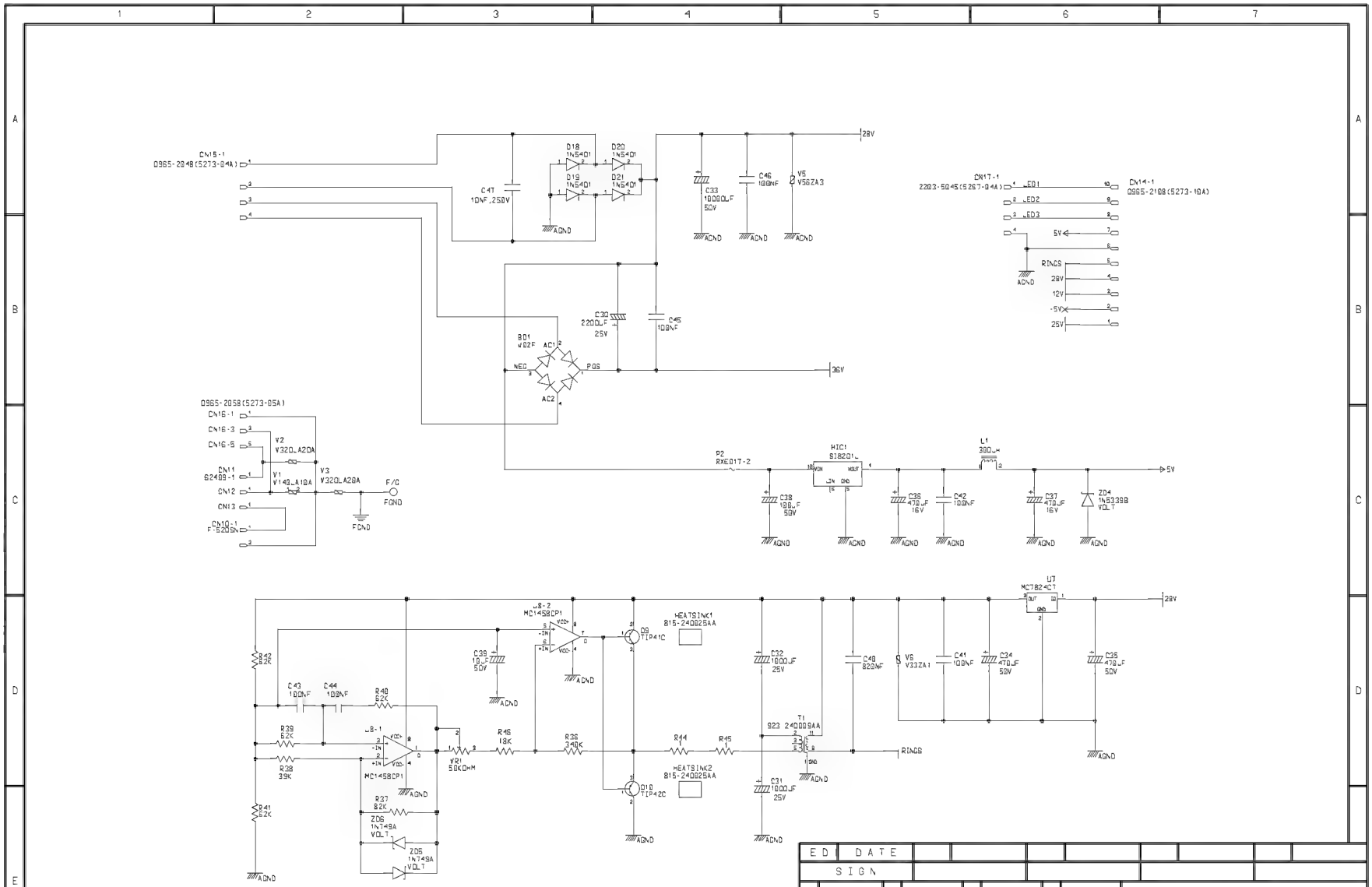

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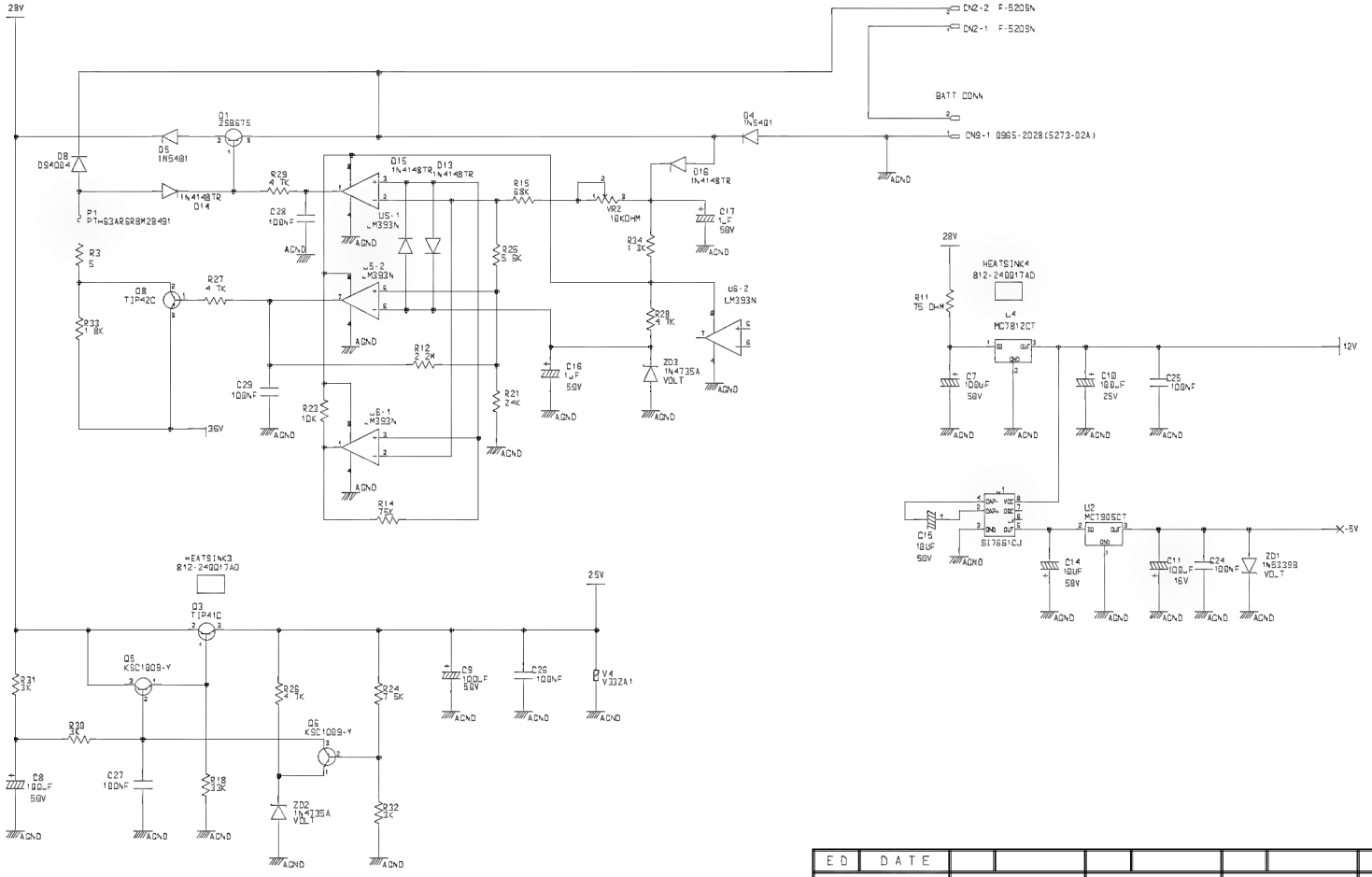


| ED | DATE | | | | | | | | |
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| DWG | | ENG | | CHK | | APP | | NX-308 POWER | | |
|---|---|---|---|---|---|---|---|---|---|---|
| REF NO | GA92-01113A | | | | | | | SEC | GADB-000051 | 3/4 |

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A3-50PFP (297X420)

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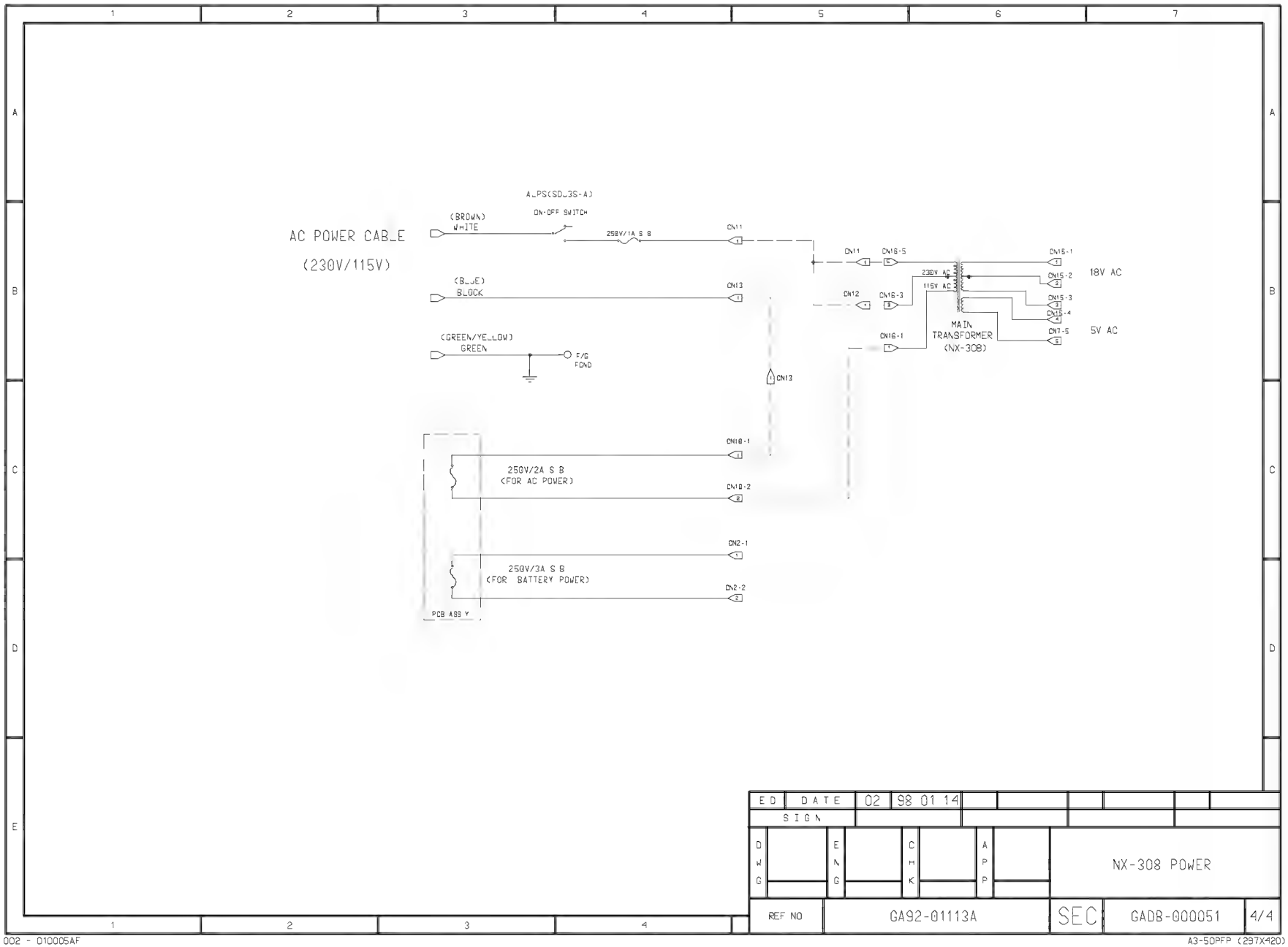

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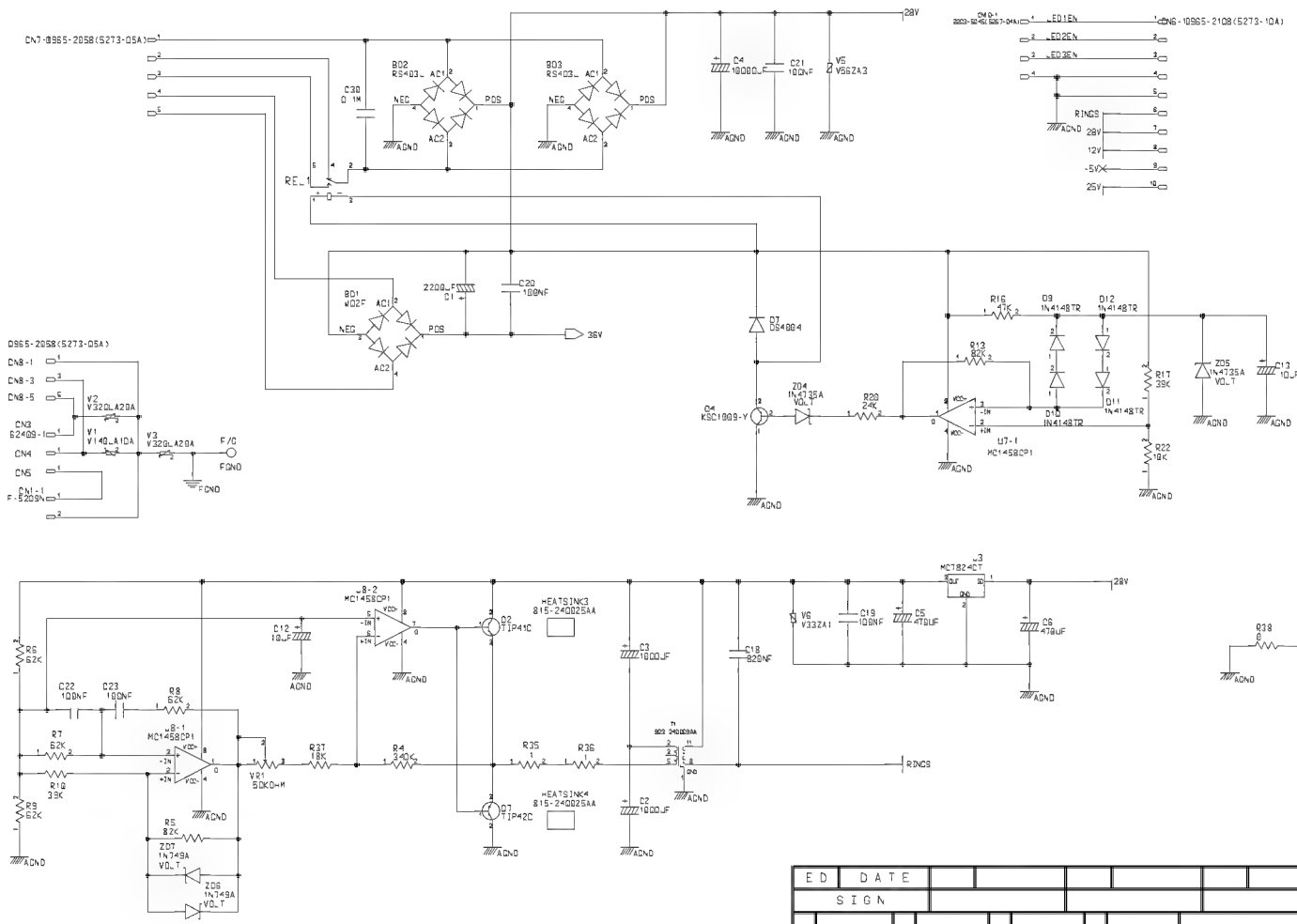


| ED | DATE | | | | | | | |
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| DWG | | ENG | | CHK | | APP | | NX-820/1232 POWER |
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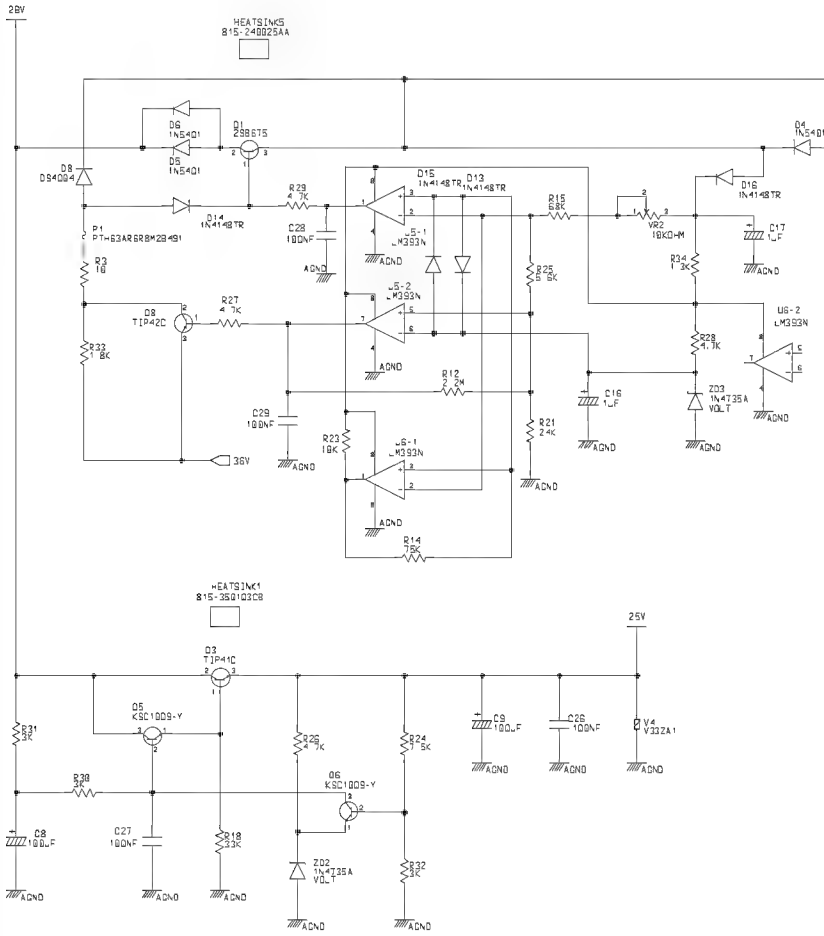


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| DWG | ENG | CHK | APP | NX-820/1232 POWER |
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| REF NO | GA92-01123A | SEC | GADB-000052 | 3/4 |
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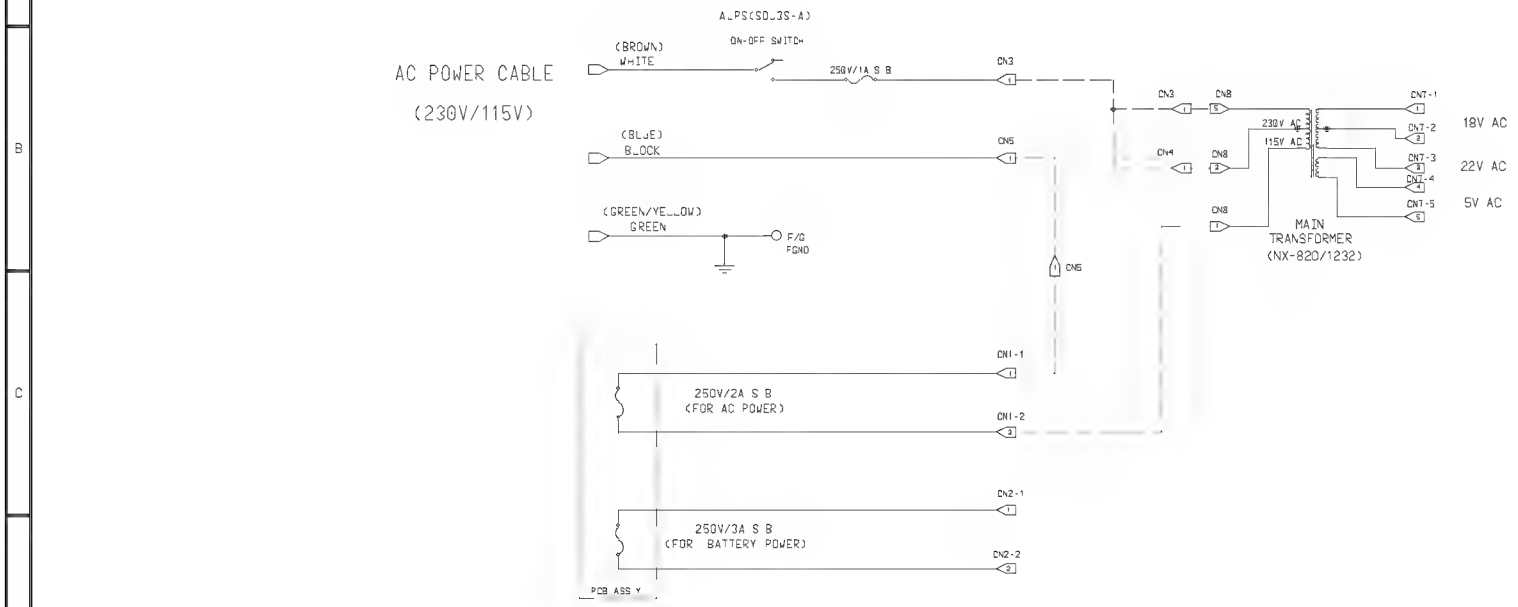


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| SIGN | | | | | | | | | | | | | |
| DWG | | ENG | | CHK | | APP | | NX-820/1232 POWER | | | | | |
| REF NO | GA92-01123A | | | | | | | SEC | GADB-000052 | | | | 4/4 |

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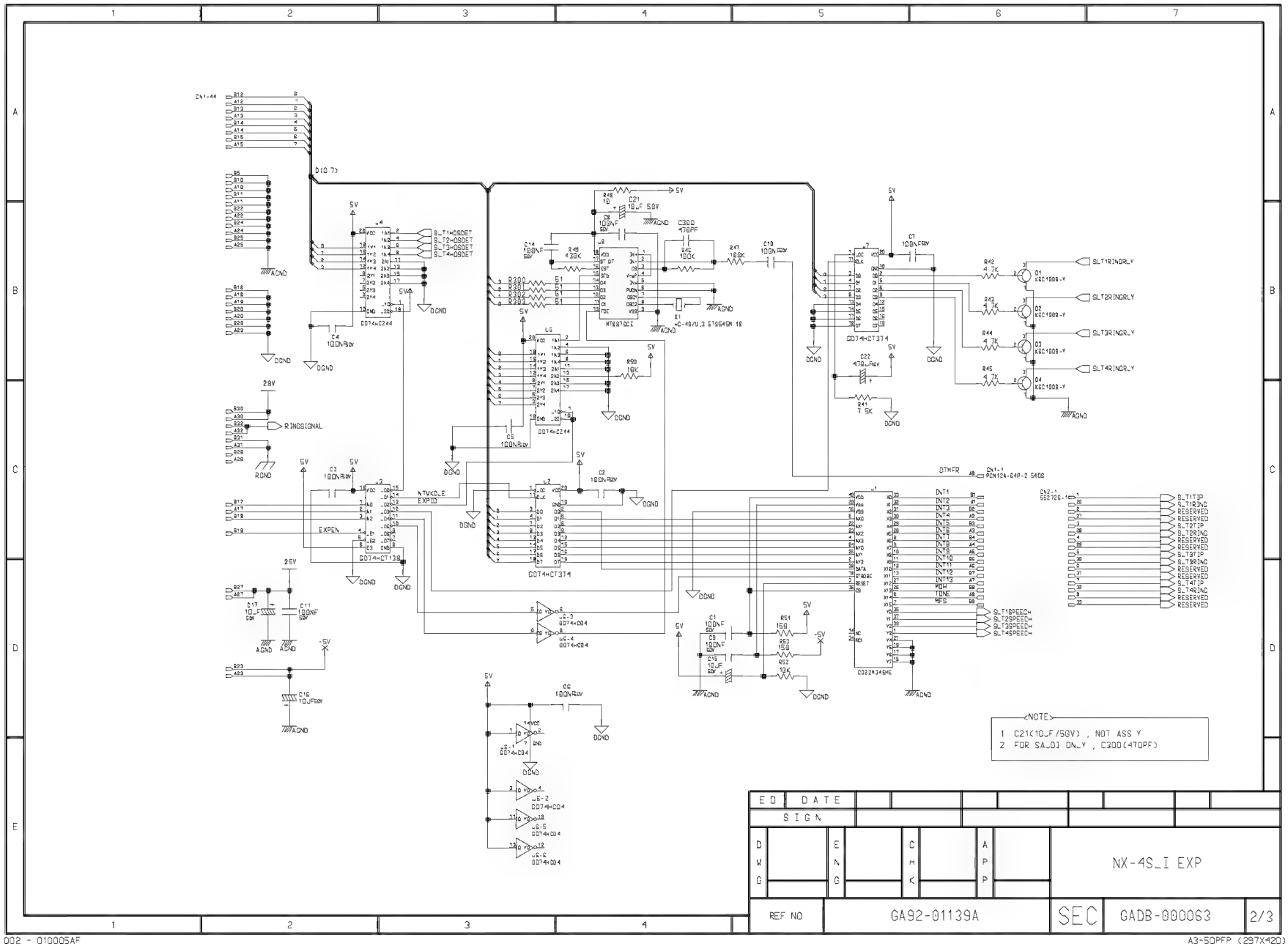

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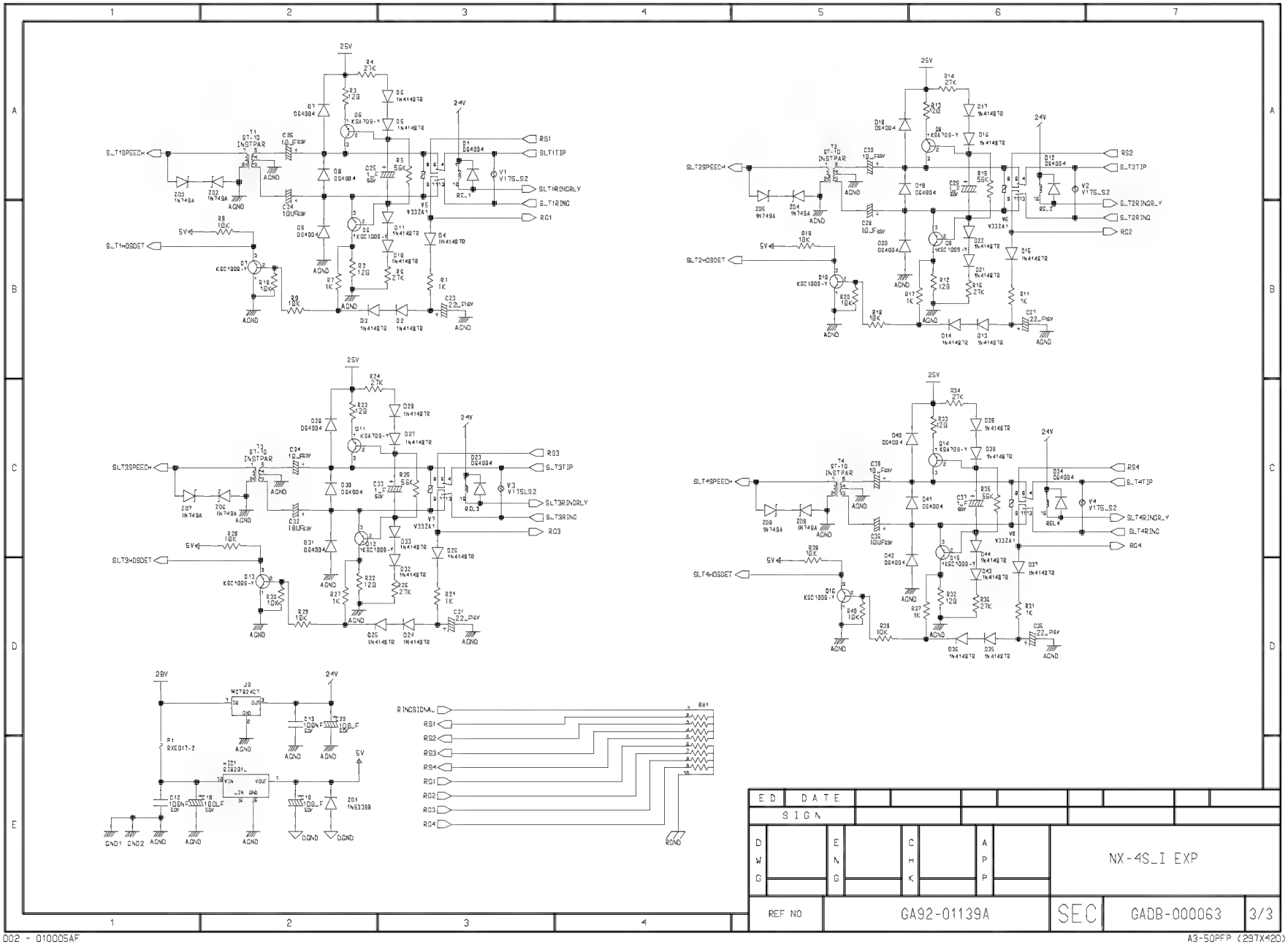


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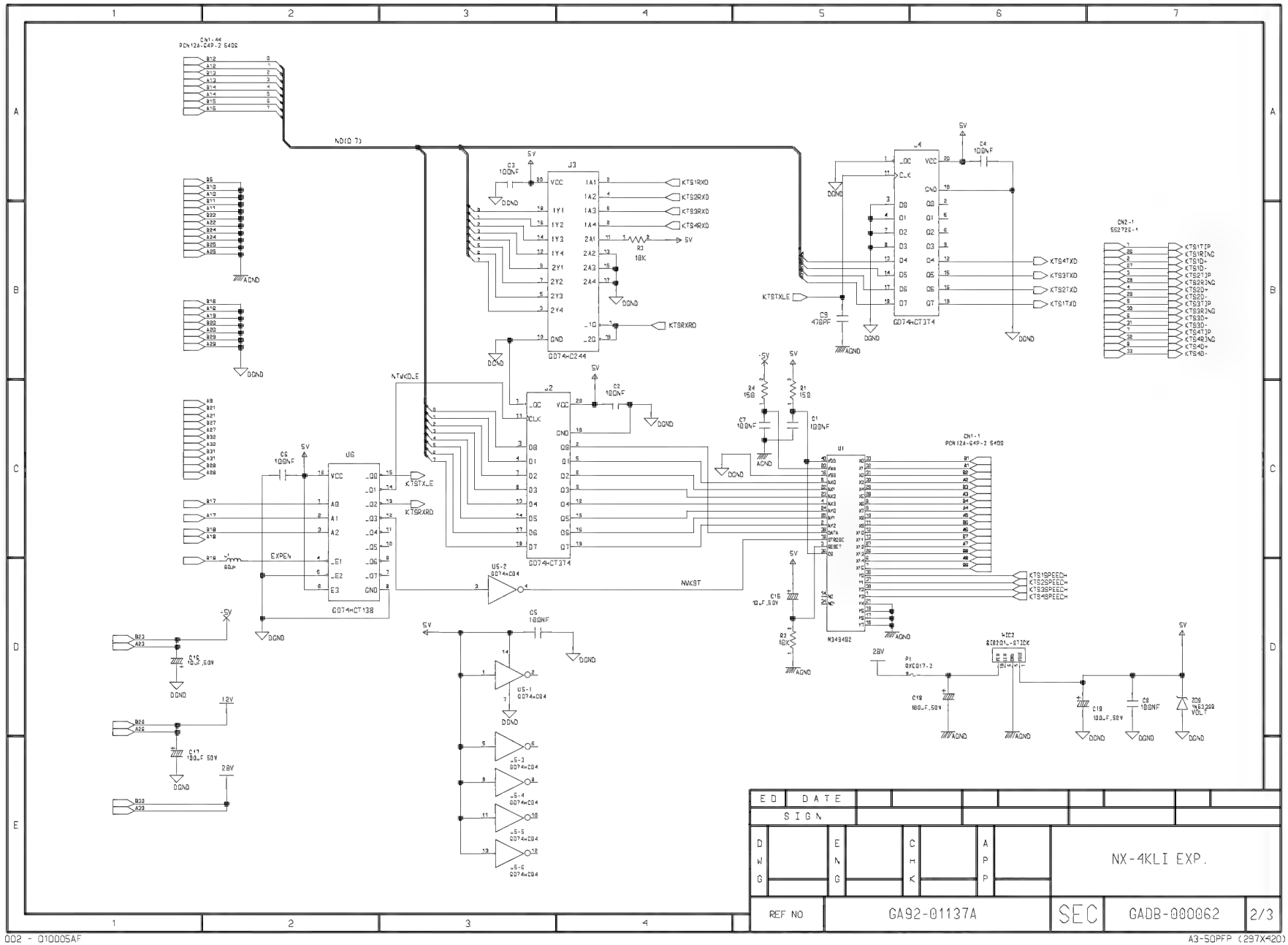

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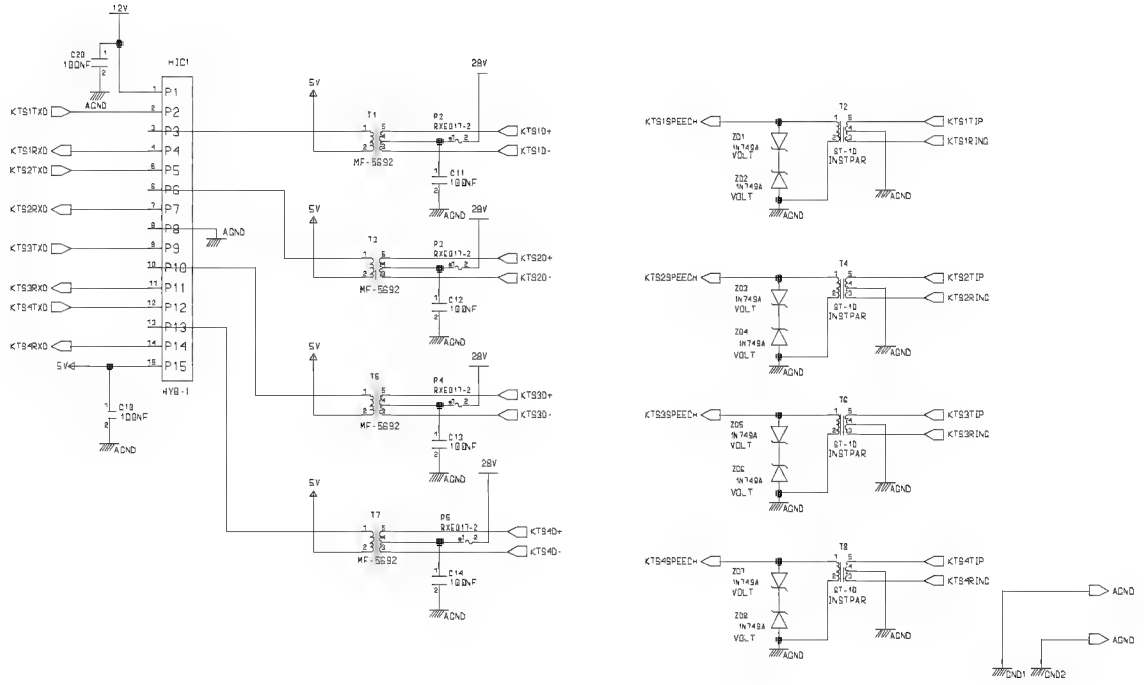


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| REF NO | GA92-01137A | | | | | | | SEC | GADB-000062 | | | | | 3/3 | |

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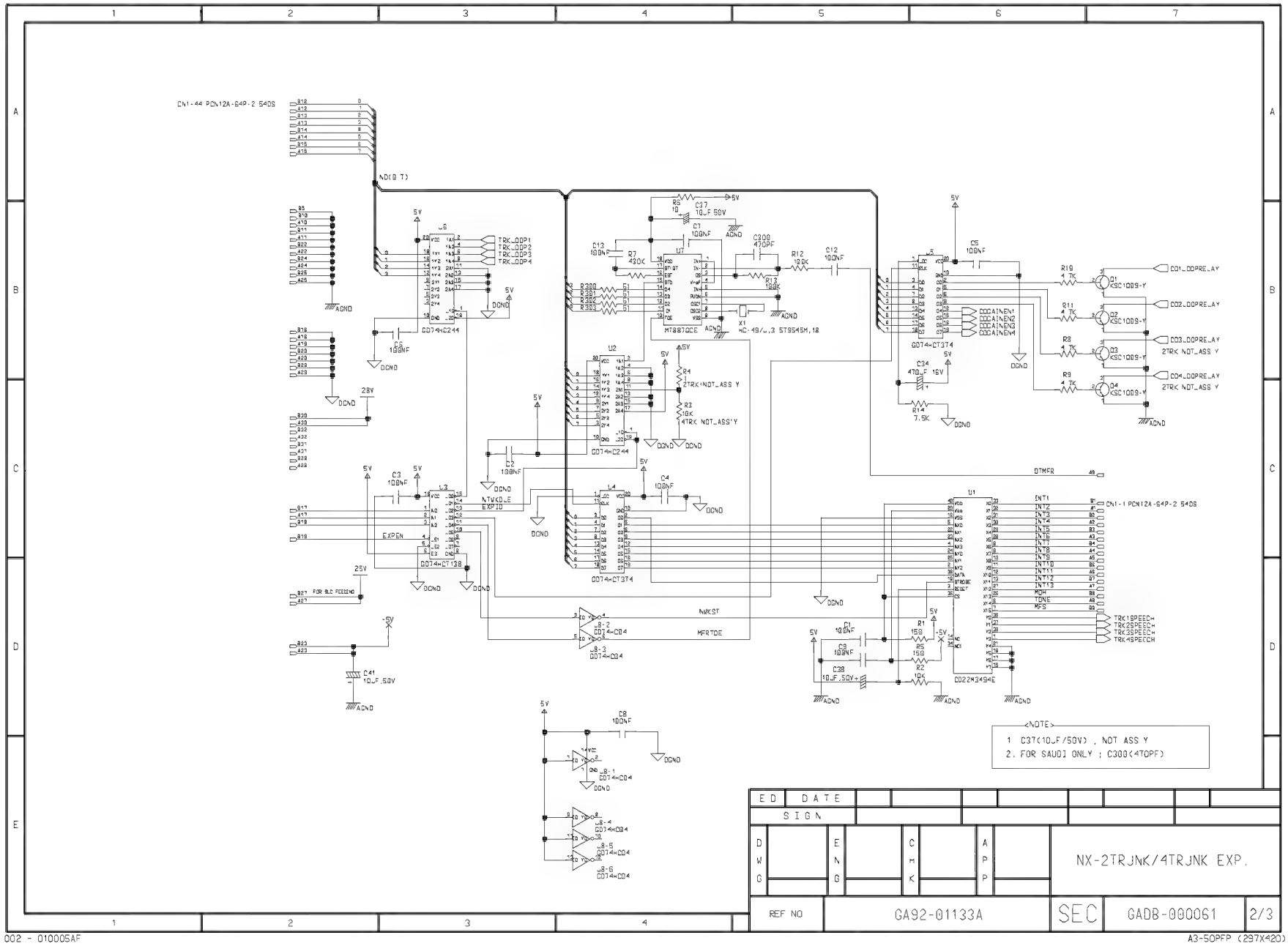

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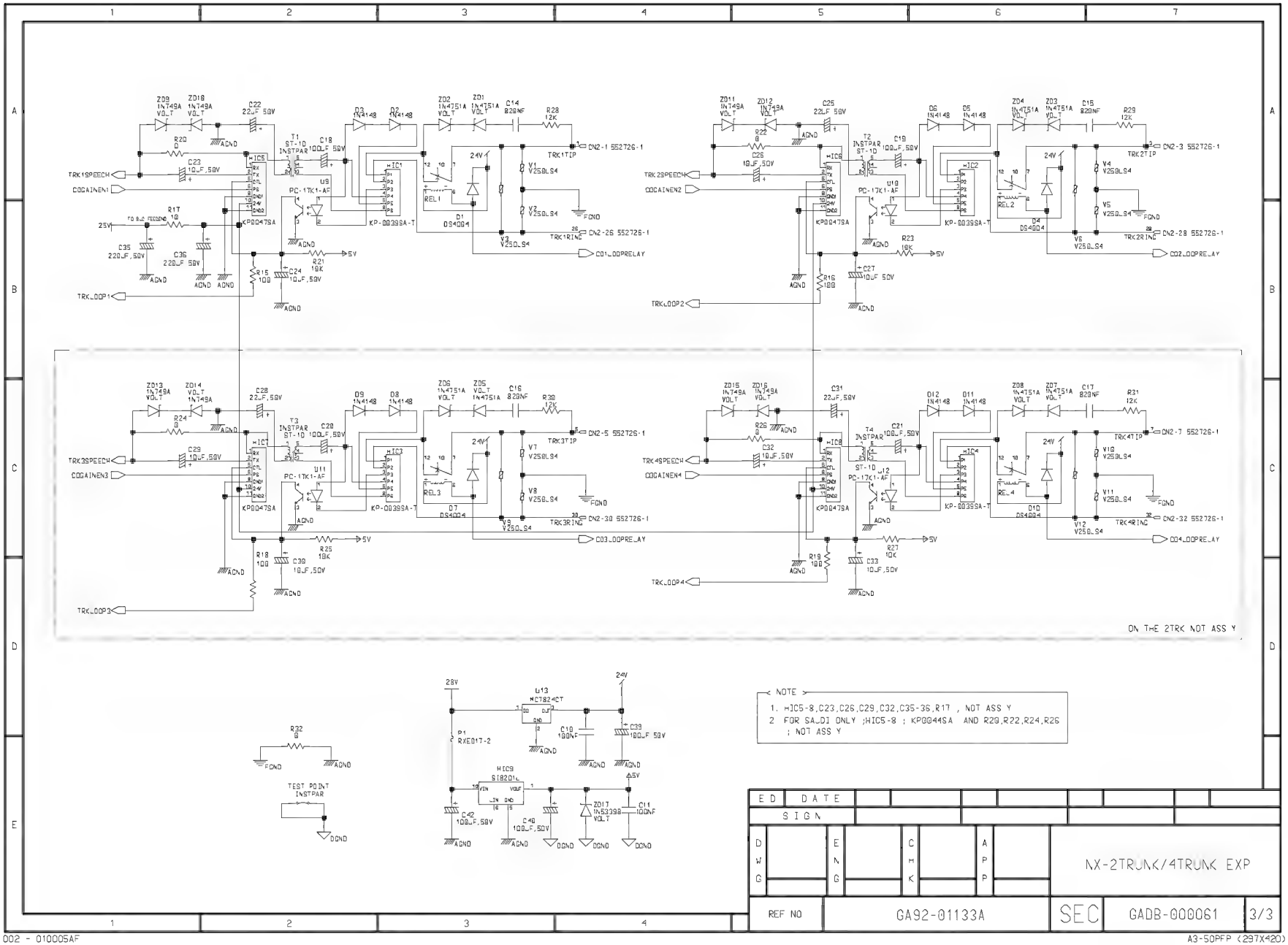

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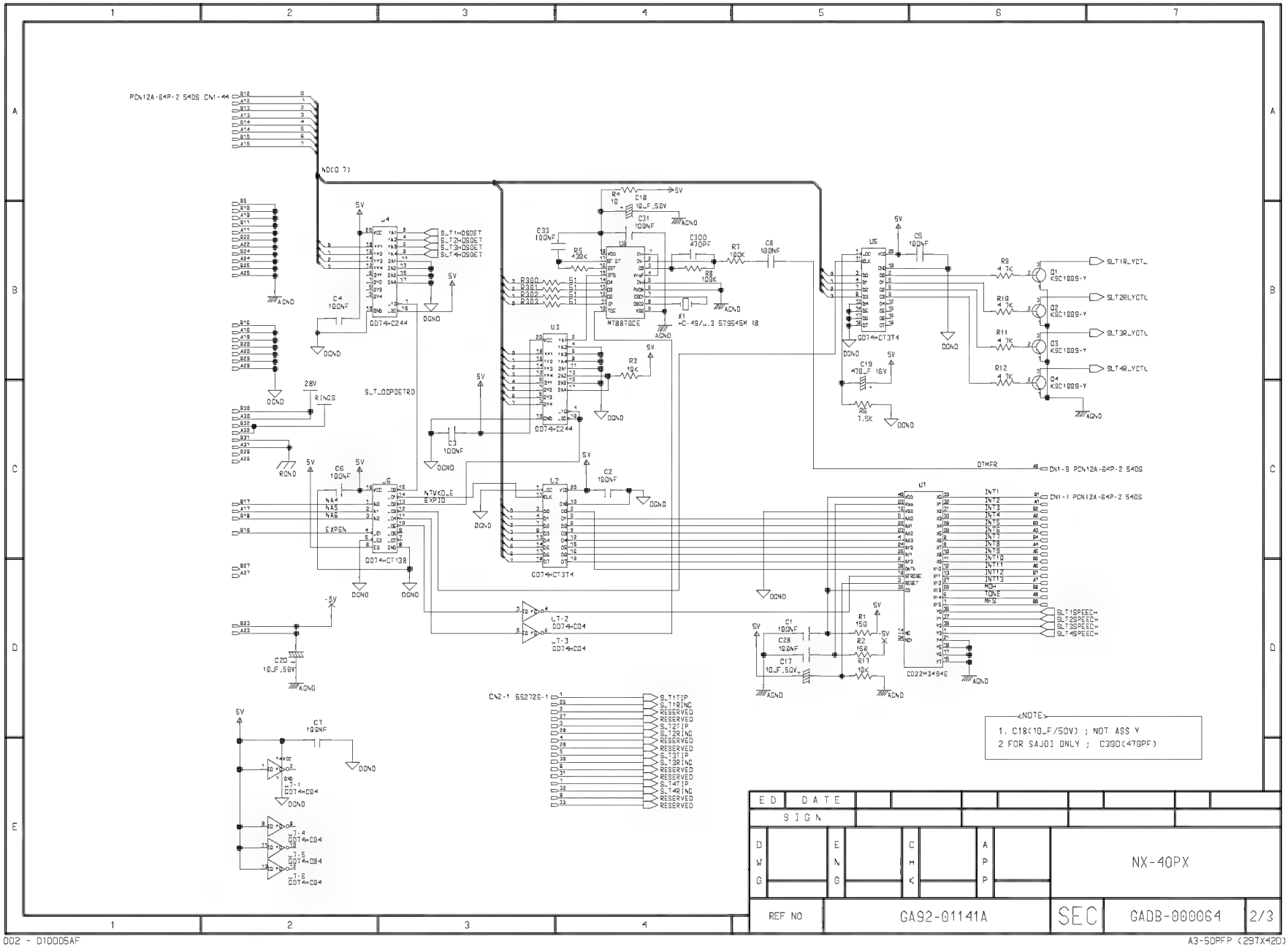

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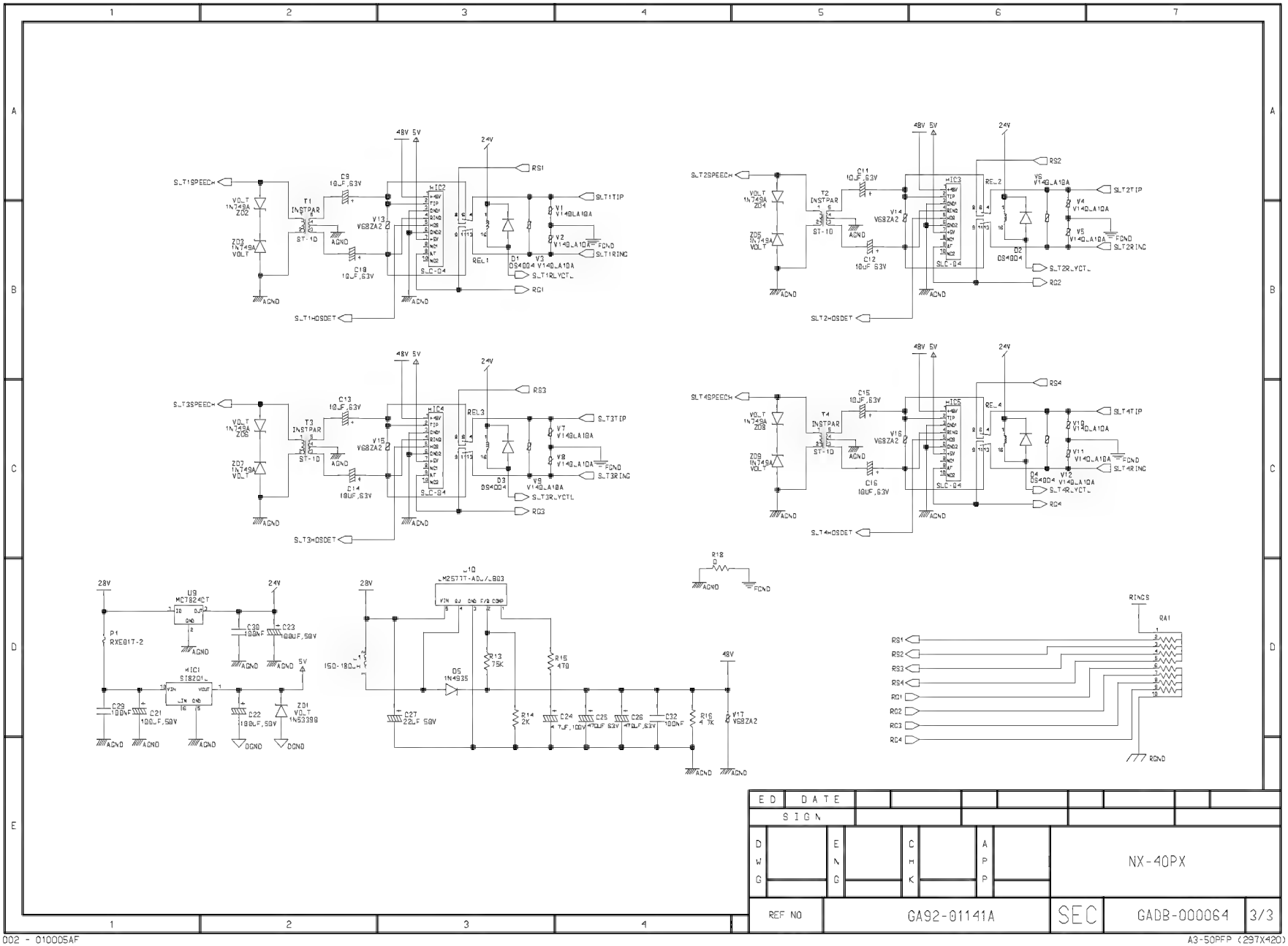


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| REF NO | GA92-01141A | | | | | | SEC | GADB-000064 | | 3/3 |

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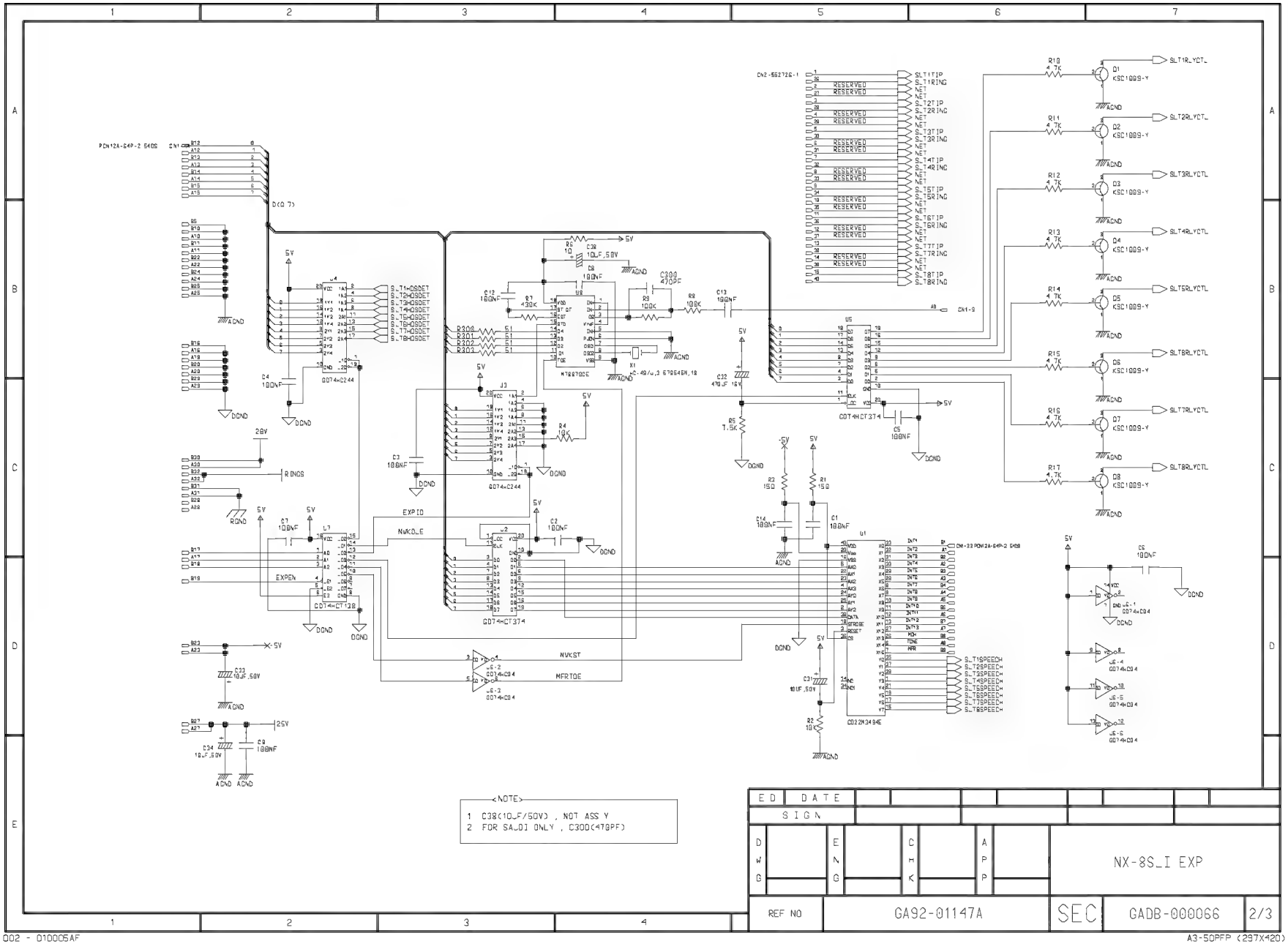


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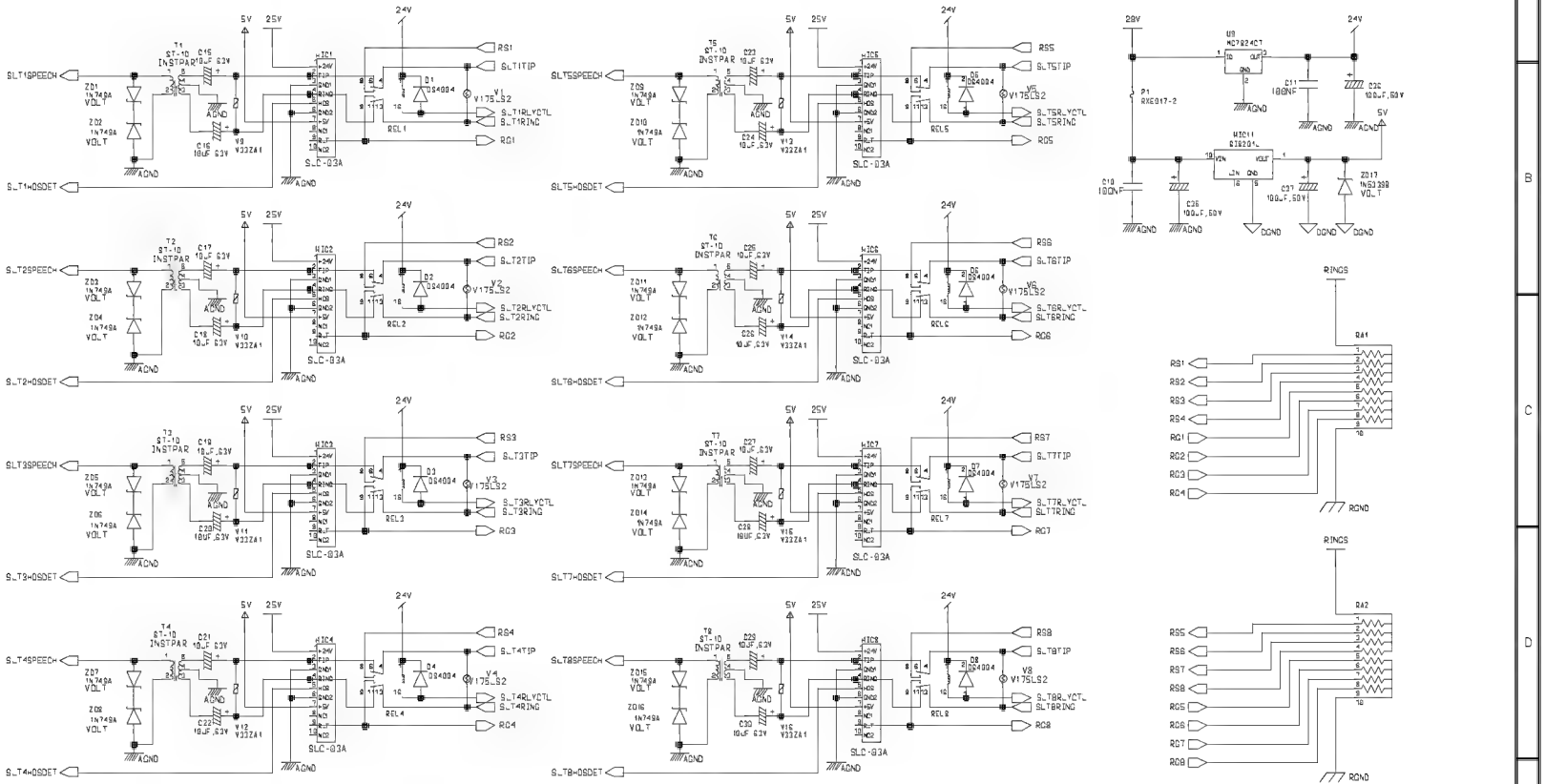


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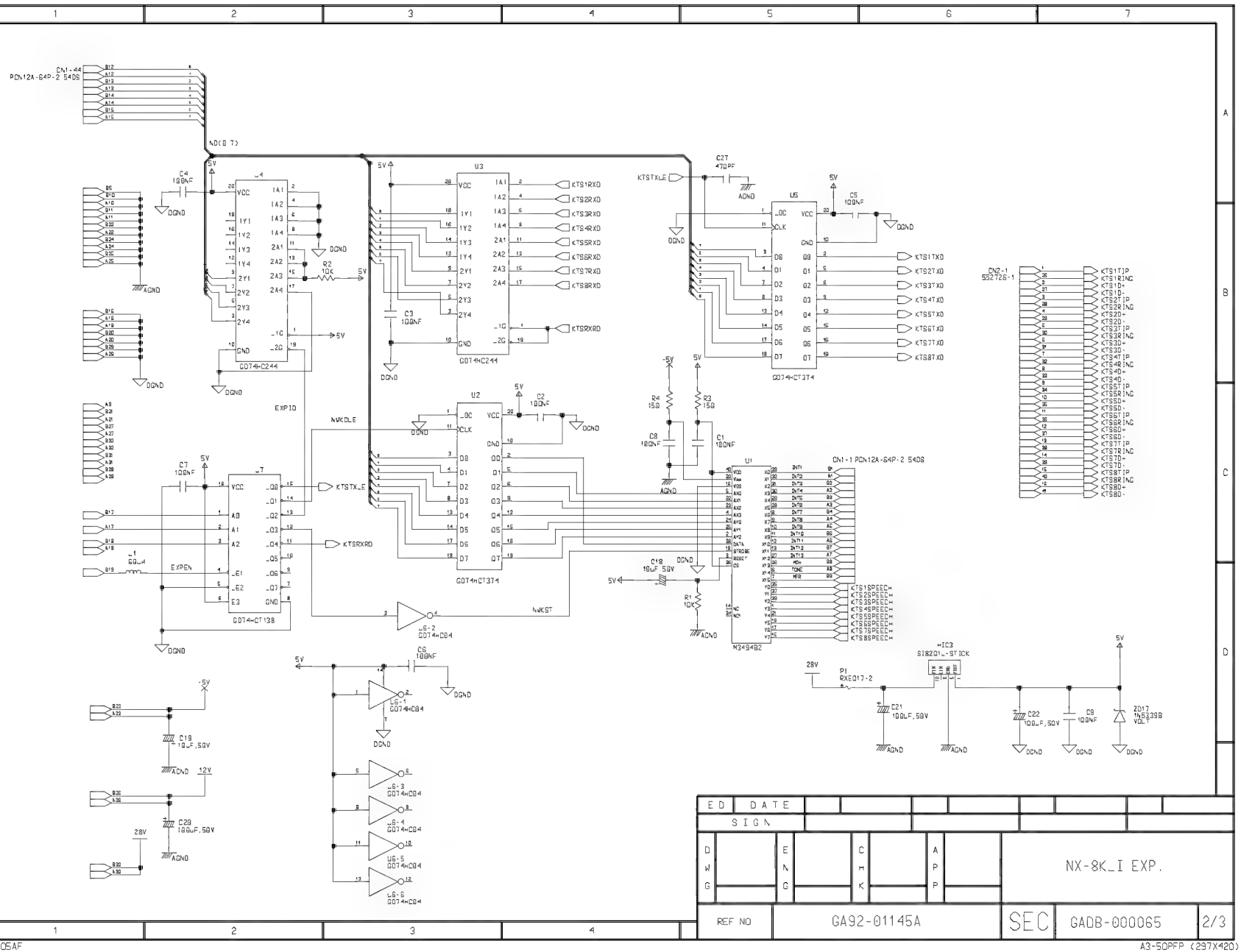


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| REF NO | GA92-01145A | | | | | | | SEC | GADB-000065 | 2/3 |

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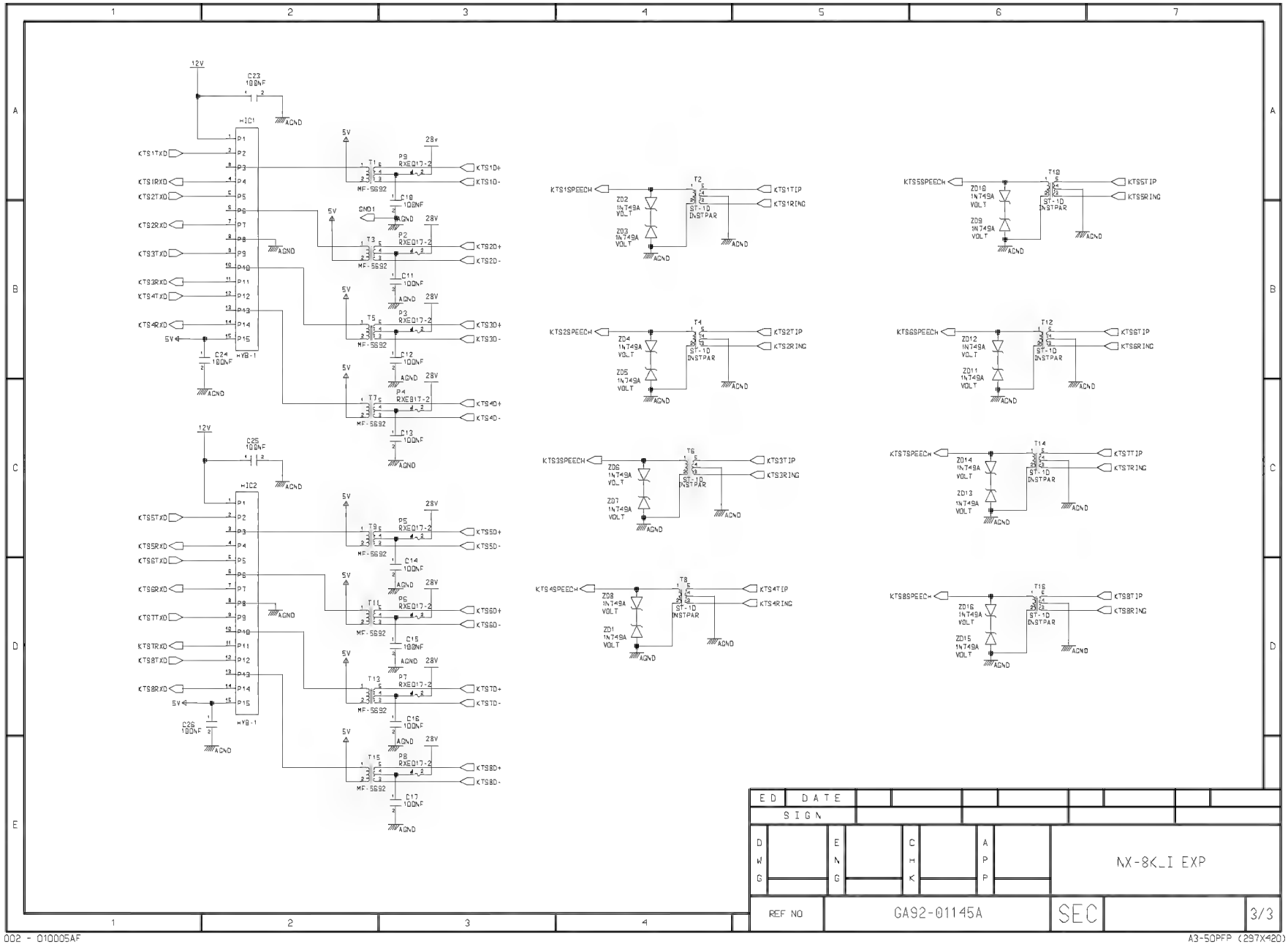


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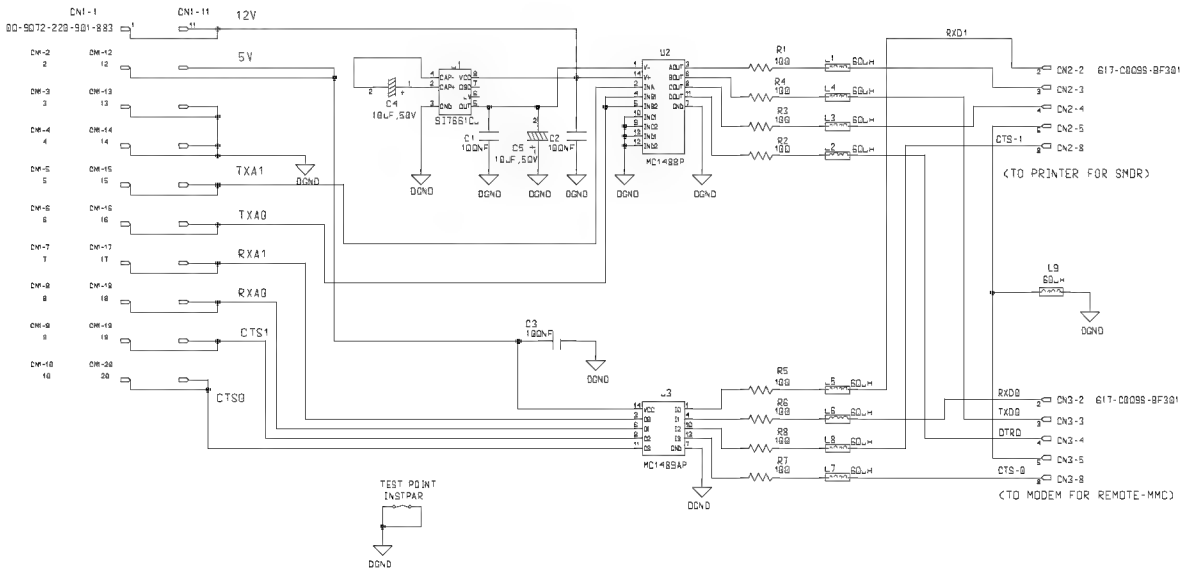


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| REF NO | GA92-01117A | | | | | | | SEC | GADB-000058 | | | | 1/1 |

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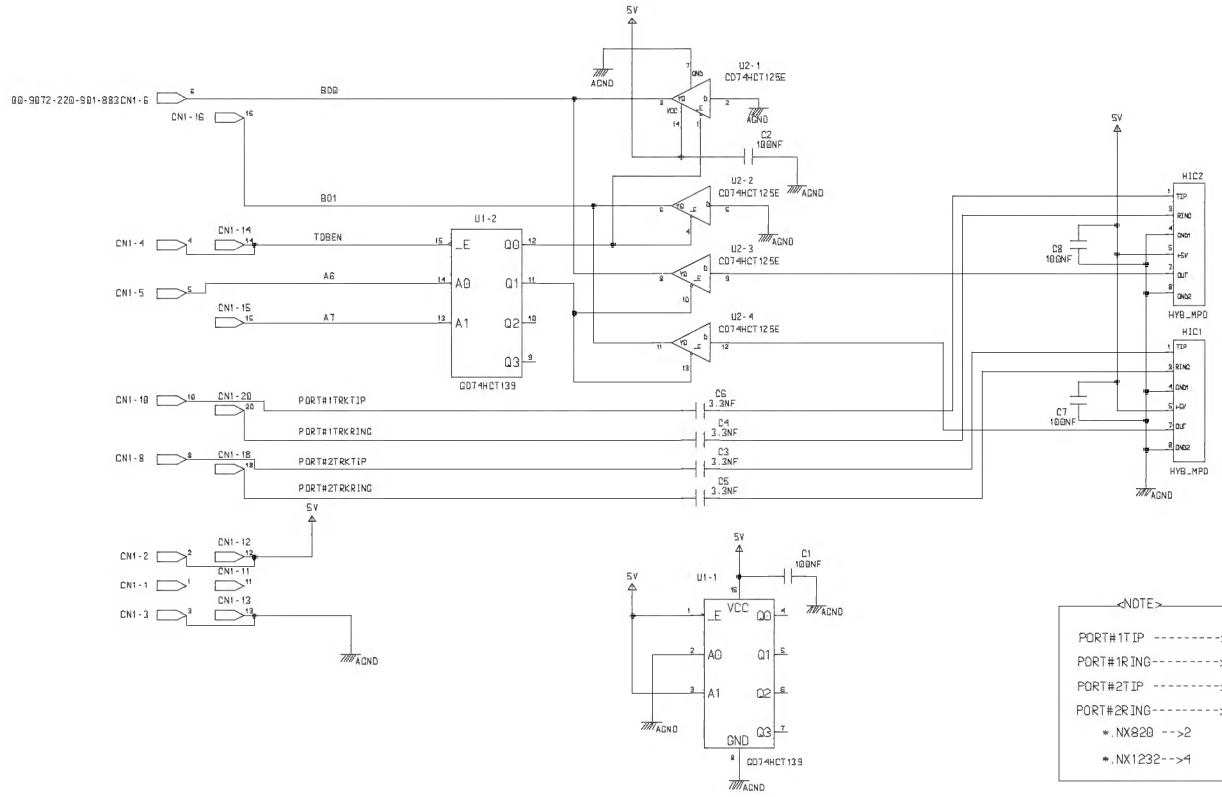


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| D W G | | E N G | | C H K | | A P P | | NX-MPD (12,16KHZ) | |
| REF NO | GA92-01131A | | | | | | SEC | GADB-000059 | 1/1 |

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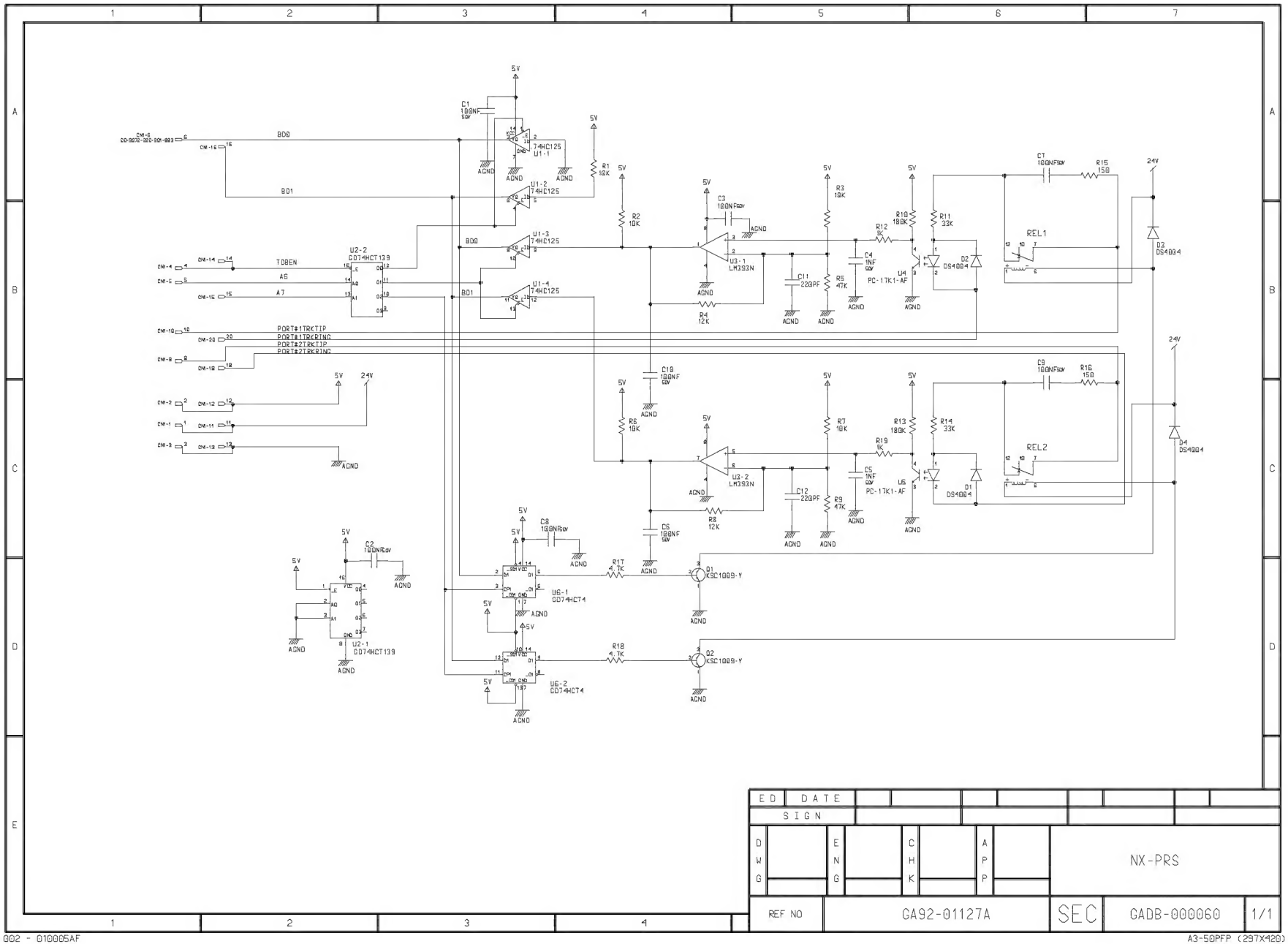


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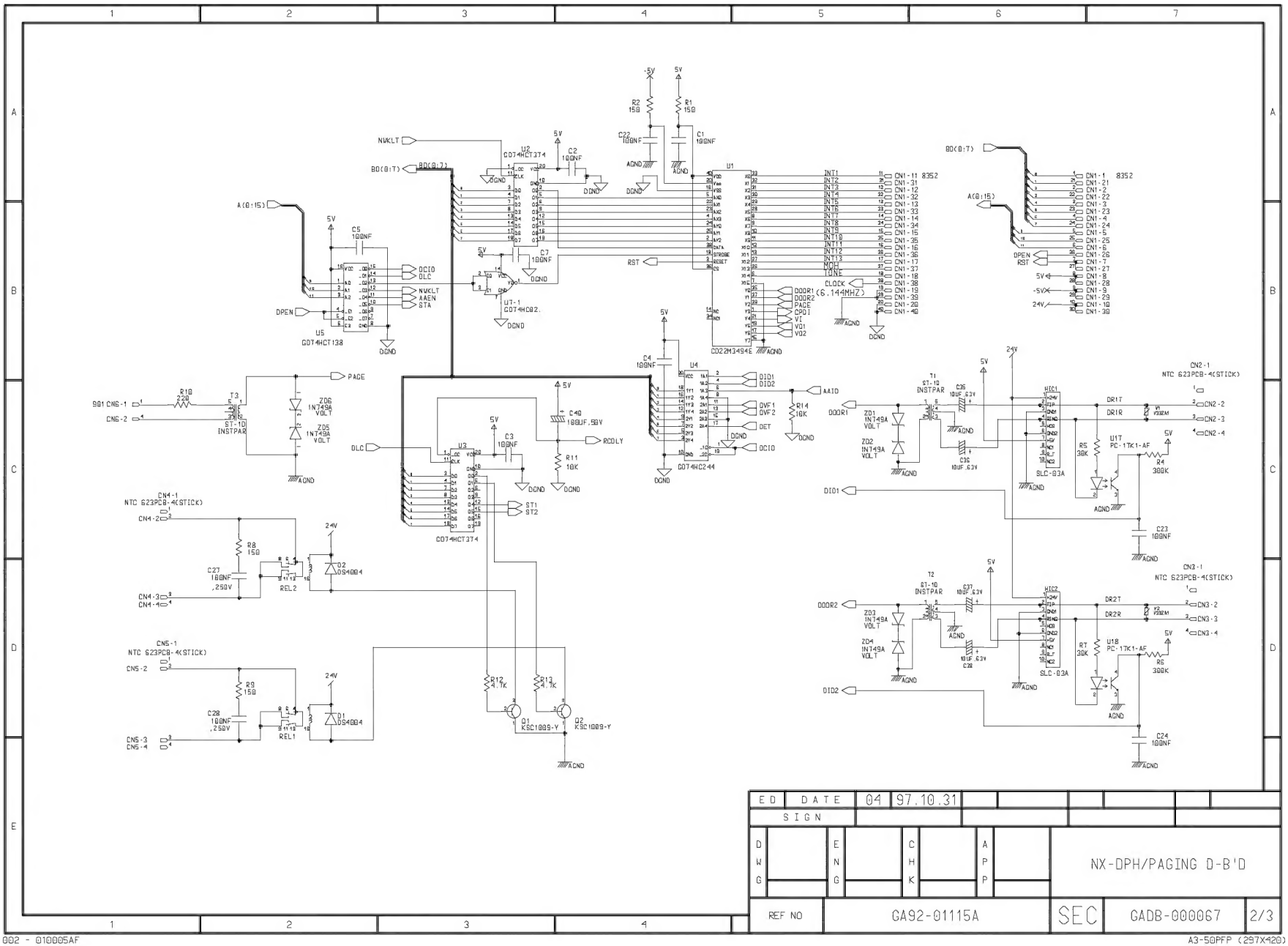


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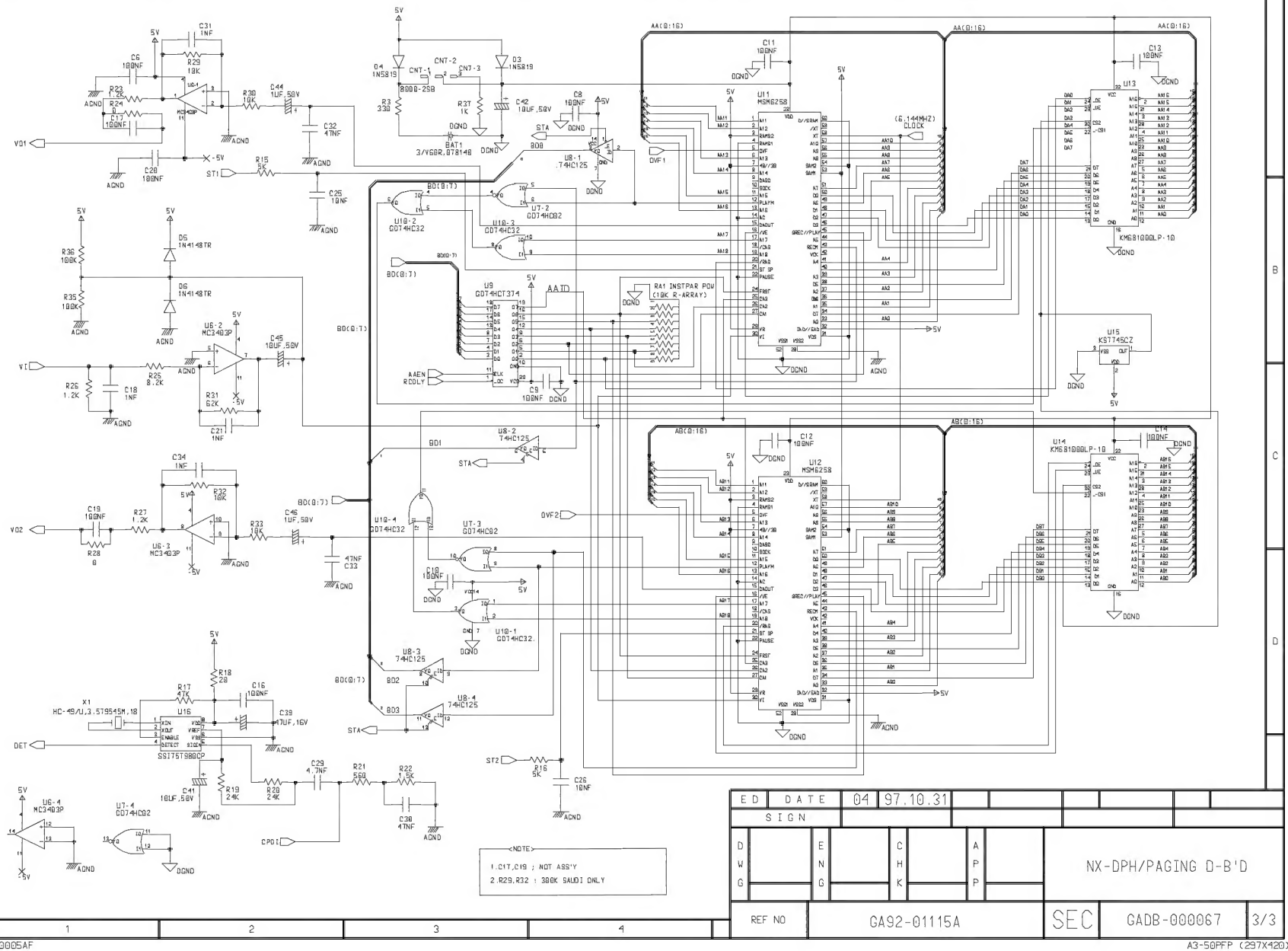
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